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INDUSTRIAL PSYCHOLOGY
AND ITS SOCIAL FOUNDATIONS

UNDER THE EDITORSHIP OF

GARDNER MURPHY

INDUSTRIAL PSYCHOLOGY AND ITS SOCIAL FOUNDATIONS

BY MILTON L. BLUM, Ph.D.

SUBCHAIRMAN, PSYCHOLOGY DEPARTMENT, SCHOOL
OF BUSINESS AND CIVIC ADMINISTRATION, CITY
COLLEGE OF NEW YORK

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INDUSTRIAL PSYCHOLOGY
AND ITS SOCIAL FOUNDATIONS

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Preface

Industrial Psychology and Its Social Foundations attempts to present a system of industrial psychology in such a way as to bring its various parts into a meaningful whole. The author believes firmly that the *social* bases of industrial psychology must be understood if the promotion of more harmonious employer-employee relations in a democratic society is to be given realism and meaning.

Since he regards this field as relatively new, he feels that a book of this nature should pioneer and that the major emphasis should be on new approaches to current problems. Most of the material is taken from psychological sources, but other fields are tapped when desirable, and the most recent research is reported wherever possible. Although much if not all of the material is controversial, the author has tried to present all points of view fairly. Nevertheless, he has been critical when he believes that this will help to get rid of the emotion that retards progress.

The book is intended primarily as a college text for such courses as industrial psychology, personnel psychology, business psychology, and applied psychology; but it may also be used as supplementary reading for courses in industrial engineering, labor relations, management, personnel, and the like. It should also appeal to employers and union executives, as well as to others who are interested in the subject.

An introductory chapter is followed by an extensive report on the Hawthorne Studies, extensive because of their significant contribution to an understanding of the field and its problems.

The next four chapters are concerned respectively with employee attitudes, whose importance in industry is now well recognized; with job satisfaction and dissatisfaction, which depend to a large extent on employee attitudes; with industrial morale, which must not be confused with job satisfaction; and with the use of incentives as a means of increasing job satisfaction and morale.

Job analysis and the securing of occupational information constitute the subject matter of Chapter 7. Chapter 8 reviews some of the principles of learning, to whose development psychologists have made a major contribution, and describes some of the various training methods used in industry. Time and motion studies are discussed in Chapter 9, and the psychological nature of much of the employee resistance to them is brought out. Such factors as fatigue and monotony are of concern to both employer and employee, and the industrial psychologist's contributions in this field are described in Chapter 10. The influence of the work environment on production has been the subject of many studies, some of which have led to exaggerated claims; nevertheless, the importance of the experimental method has been clearly demonstrated. Chapter 11 and parts of Chapter 2 set the stage for a more accurate understanding of the influence of the industrial environment. The psychological factors contributing to accidents are reviewed in Chapter 12, and a positive program for reducing them is presented.

Effective leadership, an important problem in industry, is not an entity in itself but rather the result of the relationship between subordinate and superior; the psychological needs in this relationship are discussed in Chapter 13. The discussion of industrial warfare in Chapter 14 is presented in terms of the various types of group formations in our industrial society, the underlying motives, and the resulting conflicting needs. Such insight may well aid in reducing employer-employee strife. Unemployment, which is always present in some degree, is important because of the psychological changes that take place in the unemployed individual and in his family as well; these are discussed in Chapter 15.

Psychological tests can be helpful in industry provided their limitations are understood clearly. Such tests are discussed in Chapter 16, and actual test programs used in industry are described in Chapter 17. The next three chapters are concerned respectively with consumer research, and with the contributions of psychologists in the fields of advertising and selling. The final chapter is a summary and integration of the entire book.

ACKNOWLEDGMENTS

The students in my classes in industrial psychology over the past fifteen years have been a constant source of inspiration, for their challenging questions and mature deliberations have forced my development and enabled me to crystallize many of the ideas that are presented in the book. The firms for which I have worked both as an employee and as a consultant have contributed the necessary element of realism to what otherwise might have been an academic discourse.

Of the many individuals who have helped me in innumerable ways, I acknowledge a special debt of gratitude to Miss LaVerne Burton, Mrs. Beatrice Pruski, Dr. Alexander Mintz, and Dr. Virginia Miles. Dr. Gardner Murphy has always been a profound source of inspiration to me, and I count it a distinct privilege to write a book under his editorship.

MILTON L. BLUM

September, 1948

INDUSTRIAL PSYCHOLOGY

AND ITS SOCIAL FOUNDATIONS

1. Introduction

INDUSTRIAL psychology offers a dynamic solution to the perplexing problems which confront our industrial society and economic system. It is a means of encouraging and promoting democracy in industry and thereby enhancing the satisfactions of the employers and the employed. It promotes greater efficiency, but this is a secondary consideration. Efficiency has been overemphasized and often regarded as the sole objective of industrial psychology. Various efficiency systems under the guise of "scientific" management have been proposed and have been effective from time to time in bringing about temporary increases in production, but practically all have overlooked the tremendous importance of the worker as an integrated social human being.

If industrial psychology is to be distinguishable from "scientific" management and other systems which may border on its field, it must boldly expound the view that democratic principles must be applied to industry. Its goal should be the satisfaction of man, not of any one man to the disadvantage of others, or of one group over any other. Men must be free to express their feelings, to reach goals, produce, and develop as secure individuals. These and other freedoms are possible in a democracy and are also possible in an industrial system operating in a democratic fashion. Efficiency then follows as a necessary accompaniment.

The industrial psychologist may be a professor at a university. He may be employed by a large corporation. He may be a consultant to a trade association, to retailers or manufacturers. In the future he may be on the staff of a labor union. Regardless of the field in which he works, the industrial psychologist must report research findings accurately. Hence the need for an unbiased approach is great if he is to make his full contribution to society.

Although industrial psychologists have been employed predominantly by large companies, this does not mean that small business organizations cannot benefit from the correct application of the principles and generalizations of industrial psychology. As more students of psychology become interested in the industrial field and as more small businessmen are made aware of the benefits of industrial psychology, greater advantages will accrue to our society. Small and large business organizations have similar problems and therefore the findings are likely to be applicable to both.

DEFINITION OF INDUSTRIAL PSYCHOLOGY

PSYCHOLOGY studies the behavior of man with the aid of scientific methodology. It uses the experimental method—that is, observation under controlled conditions—to gather data. It also uses other methods to obtain facts, such as the case history method and observation of development as it takes place. Psychology accepts introspection—or a subject's report that describes mental processes—as a source of data. It is interested in obtaining facts which can be readily verified and duplicated.

The term "psychology" is not synonymous with "common sense." Often when "common sense" is applied, the conclusions drawn are incorrect because of either insufficient information or a confusion of cause and effect.

Another term used incorrectly in connection with psychology is "human nature." People often attempt to explain behavior by attributing it to "human nature."

This is merely a verbalism; it does not explain the behavior. Sometimes the term implies that people act in a certain way because of inherited predispositions. The assumption of an inherited predisposition without valid proof does not stand up in the science of psychology.

Industrial psychology draws upon the facts, generalizations, and principles of psychology. It uses the method prescribed in the parent body. Because it applies the techniques of psychology to the industrial scene and the problems confronting it, industrial psychology formulates and modifies procedures to meet the conditions found in business rather than in the laboratory.

Industrial psychology is simply the application or extension of psychological facts and principles to the problems concerning human relations in business and industry.

SCOPE OF THE INDUSTRIAL PSYCHOLOGIST'S WORK

THE psychologist employed in industry has a varied job and varied titles. His main function is to render service to the employer, to the employee, and to the various technical specialists in the organization.

Taft (*10*) discusses some of the industrial functions for which the psychologist is qualified. Included are job analysis; motion studies; salaries and wages; selection of new employees; transfers, promotions, and terminations; training; problem employees; employee rating; industrial hygiene; morale; and research. The psychologist employed by an industrial organization is likely to find that he is required to attack any one of these problems at any time.

An example of the varied nature of the work is given in an article by Bills (*1*), describing a typical workday of an industrial psychologist. The day started with a conference at 9 A.M. which was called as a result of an interview held the preceding afternoon. The conference was to decide on the placement of an employee for a two-month period. This employee had been diagnosed as mentally ill and the company was attempting therapy by a psychiatrist rather than resorting to immediate dismissal. The second problem for the psychologist was an attempt to predict whether a person's ability to punch Hollerith cards could be ascertained in three weeks. The next problem concerned the transfer of two employees to fill two vacancies. Problems concerning salary levels and rating scales occupied the remaining portion of the morning. Immediately after luncheon the psychologist had to meet with the Employee's Loan Fund Committee; the particular problem had arisen as a result of a misapplication of some funds. The psychologist next talked with a cleaning woman who felt that the supervisor was not giving her a fair deal. Another employee who had been married for six months asked the psychologist for advice on how to inform her disapproving parents.

Actual test development and research thus played only a small role in this particular day's work. The psychologist who is on the staff of an organization is likely to find that the specific minor problems which arise each day may interfere with his major work. He must therefore be flexible and prepared to handle a number of tasks and projects concurrently.

Each of the chapters in this book will discuss one segment of the various duties of the psychologist in industry. As has been stated, the duties of an industrial psychologist and the title assigned to him are likely to vary. Table 1 lists firms that employ psychologists, and the titles given them.

CONSULTING ORGANIZATIONS

A PSYCHOLOGIST, in addition to being directly employed by a business organization, is also found in many consulting organizations. Consulting on problems of a psychological nature is "big business." The oldest and largest organization of this type is The Psychological Corporation, which was organized in 1921 by a group of psychologists. The

TABLE 1. Business and Industrial Organizations Employing Psychologists

Firm Name	Title
American Viscose Co.	Director Foreman Training
Benton & Bowles, Inc.	Copy Research Chief
Caterpillar Tractor Co.	Personnel Consultant
Columbia Broadcasting System	President
Daniel Starch and Staff	President
Dun & Bradstreet	Asst. Director Market Research
DuPont Company	Personnel Research, Personnel Department
Eastman Kodak Company	Director Psychological Research in Color Control Department
Federal Advertising Co.	Director of Research
General Aniline & Film Corporation	Asst. Director of Industrial Relations
Great Atlantic & Pacific Tea Co.; Toledo Branch	Asst. to Personnel Director
International Business Machine Corporation	Director of Educational Research
McCann-Erickson	Assoc. Director of Research
Needham, Louis & Brorby	Director Commercial Research and Advertising
National Analysts, Inc.	Managing Director
Owens-Illinois Glass Co.	Director of Personnel Research
R. H. Macy	Director of Testing
Schenleys Distilling Corporation	Vice-President
Standard Register Co. of Dayton	Director of Personnel and Psychology Research
United Merchants and Manufacturers, Inc.	Asst. Personnel Director
Vector Manufacturing Company	In charge, Psychological Equipment Division
Washington Post	Asst. Director of Research
Waverly Press	Admin. Research and Personnel
W. T. Grant Company	Director Research and Planning

Psychological Corporation operates through six divisions or departments (*8*). The Industrial Division had 31 client companies during 1946 in ten different states. The clients included chemical concerns, textile organizations, beverage companies, insurance firms, etc. The services rendered included evaluation of supervisory personnel, selection of salesmen, attitude and morale surveys, and construction and installation of psychological test programs. Another division of this corporation is the Psychological Service

Center, through which 209 adults received counseling. A third division of the Corporation, known as the Test Division, conducts research on psychological test development, publishes a *Test Service Bulletin,* and acts as a distribution center for various psychological tests. The Marketing and Social Research Division made 87 studies for 47 clients during 1946. This division conducts interviews throughout the country and in 1946 completed its twelfth consecutive *Barometer,* which is a report of consumer purchases of specific products. In addition to providing confidential reports to its clients, this division organizes research aimed at improving the quality of the Corporation's services to its clients. The Nurse Testing Division tests applicants for the nursing profession. A Bio-Mechanics Division was recently formed to investigate industry-wide or factory-wide production problems involving men and machines.

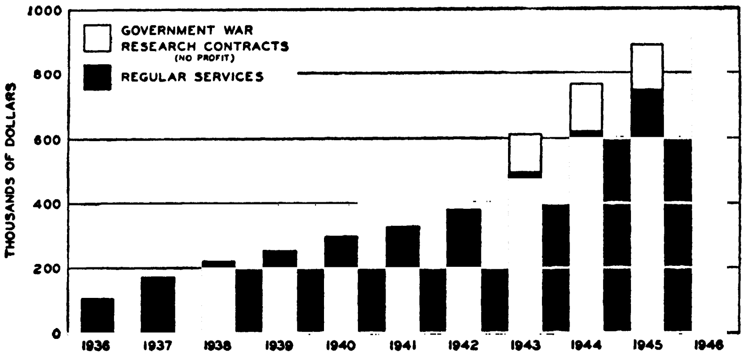

FIG. 1. Gross Revenues of The Psychological Corporation. (From *25th Annual Report of The Psychological Corporation,* 1946.)

The president of the Corporation and the directors of five of the six divisions hold Ph.D.'s in psychology. In addition to its New York staff, the Corporation has 220 psychologists throughout the country who work on assignment. Fig. 1, showing its gross revenues over a ten-year period, illustrates its steady and continued growth, and also indicates the financial possibilities of this field.

A second consulting organization is the Klein Institute. Whereas The Psychological Corporation was founded by a group of psychologists, the Klein Institute was organized by a businessman. For years it specialized in the aptitude testing of sales personnel, but more recently it has extended its services to cover other areas. The Institute is organized into four major technical departments: Analysis, Research, Consultation, and Vocational Guidance. The technical division is responsible for all aspects of the psychological work and is staffed by psychologists with Ph.D.'s. The management division is separate from the technical departments and is responsible for all financial arrangements with clients in connection with public relations and the selection and supervision of personnel.

Richardson, Bellows, Henry & Company, Incorporated, was established to provide technical assistance to business and industry in the development of scientific personnel procedures. This company, organized shortly after World War II, consists primarily of psychologists who had previously worked together in the Personnel Research Section of the Adjutant General's Office of the U. S. Army. This firm does work in test development, employee training, and attitude and morale surveys.

Another organization engaged in psychological consultation is Industrial Relations Methods, Incorporated. According to the literature describing it:

> Our staff is available to render service, consultation and research in Personnel and Industrial Relations Methods to meet the changing needs of Business Organizations.
>
> These methods include Training, Supervision, Morale, Production Problems, Incentives, Job Analysis, Job Evaluation, Wage Standardization, Personnel Evaluation, Executive Selection and Development, Labor and Community Relations, Special Employee Activities, Manuals and Education, In-

stallation of Personnel Departments, Selection, Aptitude and Classification Tests.

The fifth organization to be referred to here is Nejelski & Company. This company hires psychologists to supplement its staff according to the particular problem it is investigating for its clients. It has done work in the selection of salesmen and executives and has developed application forms, interviewing procedures, and tests for its clients. The diversified nature of its work is reflected in the publications of some of its staff members, such as "Manager Meets Union" (*3*); "Montclair Studies the Shopping Experiences and Attitudes of Its Residents (*2*); and "Must Labor and Management Fight?" (*4*).

These five companies do not exhaust the list of consulting organizations that employ or consist of professional psychologists. They have been named merely as examples of some of the companies in the field.

HISTORY AND DEVELOPMENT OF THE FIELD

It is exceedingly difficult to apply a date to the founding of any body of knowledge. However, if one must indicate a date which could be called the "birth" of industrial psychology, the most reasonable one is probably 1913, the year in which Hugo Münsterberg's *Psychology and Industrial Efficiency* (*6*) was published. This book was the first to be written by a psychologist in the field. The differences of approach between the pure and the applied science are reflected in the author's first few chapters. Münsterberg writes cautiously and in a defensive manner of his attempts to establish an applied field of psychology as a necessary counterpart of the pure field. At the present time the applied psychologist does not have to be so concerned with these problems. Münsterberg's book, which has served as a model for the development of industrial psychology, includes such topics as learning, adjustment to physical conditions, economy of movement, monotony, fatigue, and buying and selling. After the outbreak of World War I American psychologists in the applied field made many contributions; the growth of group testing, trade testing, rating scales, and the personality inventory can definitely be traced to their work toward the war effort.

In 1917 the *Journal of Applied Psychology* made its appearance; the importance of this periodical in the expansion of the field will be seen in the number of references throughout this book to publications which have appeared in it. At about this time, colleges began to introduce courses in applied psychology; and as the subject has developed, the trend has been to offer courses in specific fields of applied psychology such as industrial psychology, personnel psychology, and vocational psychology.

In the writer's opinion, the most significant piece of research in the field is the Hawthorne Studies, to which an entire chapter in this book will be devoted. These studies were started prior to the depression of the early 'thirties. The depression itself had a considerable effect on the development of industrial psychology. While it may have slowed growth in some directions, it nevertheless opened many additional areas for survey. After the depression the importance of employee attitudes began to be recognized; consequently the greatest development in recent years has been in this area. World War II emphasized once again the tremendous importance of psychology in industry and in our attempts to settle the various adjustment problems resulting from the war it is clear that industrial psychology can make significant contributions to our society.

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2. The Hawthorne Studies

THE most significant research program undertaken to show the enormous complexity of the problem of production in its relation to efficiency is the work carried on over a period of twelve years at the Hawthorne Works of the Western Electric Company. Just as Hugo Münsterberg in his *Psychology and Industrial Efficiency* set the stage in 1913 for the work of psychologists in industry, so the Hawthorne Studies, begun in 1927, can be considered as "starting the show."

In order to understand how these studies could pass from one type of experiment to another without the forced conclusions and forced pace of so many studies in this field, we need only quote Elton Mayo, professor of industrial research at Harvard and guiding star of the Hawthorne Studies.

> Researches of this type are usually impossible because of a foolish convention that institutions engaging in industrial research are expected to "pay their way" or "earn their keep." This means, in effect, that any such institution, living from hand to mouth, is committed to the futility of endless repetition of some former discovery. The interesting *aperçu,* the long chance, may not be followed: both alike must be denied in order that the group may "land another job." This confusion of research with commercial huckstering can never prosper: the only effect is to disgust the intelligent youngster who is

thus forced to abandon the quest for human enlightenment.[1]

The series of experiments that comprise the Hawthorne Studies are significant because those responsible for the work were able to investigate many of the dependent variables found in human experimentation, especially those among workers. Ordinarily the assumptions made as to the independent variables preclude the possibility of valid findings. Probably the most significant results of these studies are the fact that workers are affected by factors outside the job to an even greater extent than by those on the job itself, and that they organize into informal social groups. These organizations take precedence over management-employee organizations and determine production to as great an extent as changes of a job-environment nature. The disregard of "outside the job" factors and employee self-grouping has led many studies conducted by management to erroneous conclusions.

Although the Hawthorne Studies are not to be considered the acme of perfection or even model, they nevertheless represent a vast improvement over all the other work that has been done in the field. It is for this reason that they are reviewed in their entirety in this early chapter. The serious student of industrial psychology will thereby gain a panorama of the field. He will be able to understand the need for experimentation and he will see the difficulties of it. He will note that verbalisms are poor substitutes for facts. Further, he will acquire a sense of continuity. The Hawthorne Studies show the complete interrelatedness of the various problems and demonstrate that changes in work environment, rest pauses, hours of work, hours in the working week, fatigue, monotony, incentives, employee attitudes, employee organization both

[1] Reprinted by permission of the publishers from F. J. Roethlisberger and William J. Dickson, *Management and the Worker—An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago,* Cambridge, Mass.: Harvard University Press, 1939.

formal and informal, and employee-employer relations are all intimately related. To treat them as if they were separate is to introduce such artificiality as to make the setup unreal.

The Hawthorne Studies can be conveniently divided into five major parts, one of which has two subdivisions. Each part is an outgrowth of the preceding one. In many respects each follows the other logically, but no one could have predicted the complex nature of the findings or the ramifications of procedure from the simple, unpretentious beginning. The five studies are referred to as:

1. Experiments on Illumination
2. Relay Assembly Test Room
    a. Second Relay Assembly Test Room
    b. Mica Splitting Test Room
3. Mass Interviewing Program
4. Bank Wiring Observation Room
5. Personnel Counseling

STUDY 1. EXPERIMENTS ON ILLUMINATION

THE first experiment on illumination was conducted in three selected departments. The work performed in one department was inspection of small parts; in the second department relays were assembled, and the job in the third was winding coils. For the control situation, all employees worked under existing lighting installations so that production could be measured.

In the first department the various levels of average illumination intensity were 3, 6, 14, and 23 foot-candles. The production of the workers varied *without* direct relation to the amount of illumination.

In the second department the illumination intensities were 5, 12, 25, and 44 foot-candles. Production increased, but not solely, as a result of changes in illumination. The third department showed similar results. The conclusions drawn "brought out very forcibly the necessity of controlling or eliminating the various additional factors which affected production output in either the same or opposing directions to that which we can ascribe to illumination" (*5*).

Here, apparently, was a problem that was not as simple as it looked. A second experiment with more refined techniques was set up; it took place in only one department and two groups of workers participated. These groups were equated for numbers, experience, and average production. The control group worked under relatively constant illumination. The test group worked under three different illumination intensities. The influence of any spirit of competition (a factor not part of the experiment) was guarded against by having the two groups work in different buildings.

This second experiment on illumination resulted in perplexing but enlightening results. *Both* groups increased production appreciably and to an almost identical degree. Since this experiment did not show what increase in production could be attributed to illumination, the third experiment was undertaken.

In this experiment further refinements in procedure were introduced. Only artificial light was used, daylight being excluded. The control group worked under a constant intensity of 10 foot-candles. The test group began with 10 foot-candles but the intensity was reduced by 1 foot-candle per period until they were working under only 3 foot-candles. This group of employees maintained efficiency to this point despite the discomfort and handicap of insufficient illumination. In a fourth experiment two volunteer girls worked in a light-controlled room until the intensity equaled that of ordinary moonlight. At this stage they maintained production and reported no eyestrain and less fatigue than when working under bright lights.

The fifth and last of the illumination experiments was conducted with the girls who wound coils. During this experiment there was no real change in production. At first the intensity of the lights was increased daily, the girls reporting that they liked brighter lights. An electrician then changed the light bulbs but kept the same intensity. The girls commented favorably on the increased illumination. In the last part of the experiment the illumination was decreased; the girls said that less light was not so pleasant. However, they felt the same way when the lights remained constant, even though the electrician was supposedly reducing the illumination.

In most such experimentation the sponsors would have thrown out the evidence and the "crackpots" responsible; it would have been considered a wild nightmare, to be repressed and suppressed. Fortunately in this instance, although the specific problem was not solved, there was an awareness that more knowledge concerning problems involving human factors was essential. The Relay Assembly Test Room, the second of the Hawthorne Studies, was the result.

STUDY 2. RELAY ASSEMBLY TEST ROOM

THE initial purpose of this experiment, which lasted about five years, was to exercise more direct control over any of the many variables that could have influenced the performance of the operators in the first study.

In order to exercise greater control it was decided to use a small group of employees in a separate room away from the regular working force. The task chosen was the assembly of small relays, because it is simple and highly repetitive (approximately 500 a day), requires no machinery, and permits an accurate measure of production.

Two experienced operators who were friendly with each other were invited to participate; they in turn selected three other assemblers and the layout operator, who assigns the work and procures the parts. The situation was similar to that in the regular Relay Assembly Department except that in the regular department there was one layout operator for six or seven girls. The only other person in the room was a man who had worked on the illumination experiment. He was to keep records of what occurred and create and maintain a friendly atmosphere. A special room was fitted out, but chairs, fixtures, and work layout were similar to those in the regular department. An accurate recording device was added to the regular equipment so that it was possible to measure not only the number of relays assembled but also the time taken per relay. Temperature readings and humidity were recorded hourly. The girls took physical examinations every six weeks.

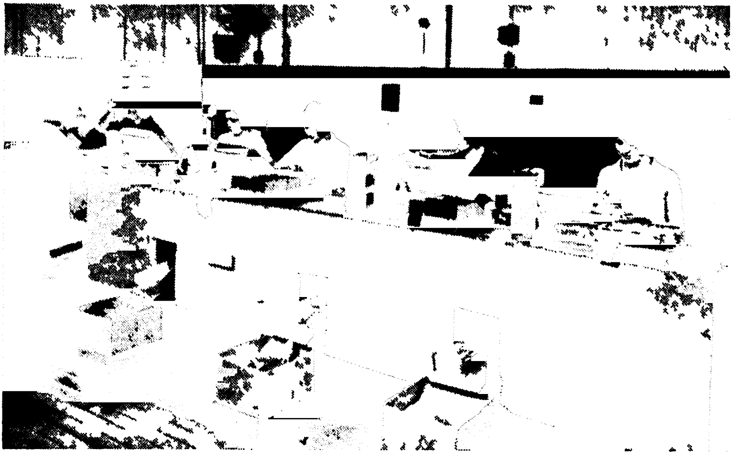

FIG 2 Relay Assembly Test Room Operators

A complete daily history was kept to give an accurate account of what went on in the test room as changes were introduced. The following is an excerpt from this history:

Monday, June 13, 1927
Operator 1A. Said she was tired today.
Operator 2A. Tired also and said her head ached.
Operator 3. Was asked if she thought she did more, less,

or about the same amount of work. Ans. "More, I'm almost up to Operator 4 and I have a bigger relay."

Operator 4. "I feel fine today, not tired or anything."

Operator 5. "I'm tired today and sleepy."

Tuesday, June 21, 1927

The foreman informed the group of their low activity for the past week. The weather was more favorable for work, cloudy and raining.

Operator 1A. "I feel fine today. Just right for work."

Operator 2A. "Today is fine for work."

Operator 3. "I went to bed at 9 o'clock last night and feel O.K. today."

Operator 4. "I feel great today."

Operator 5. "A day like this is much better for work than yesterday."

Study 2 started with six questions:

1. Do employees actually get tired out?
2. Are rest pauses desirable?
3. Is a shorter working day desirable?
4. What are the attitudes of employees toward their work and toward the company?
5. What is the effect of changing the type of working equipment?
6. Why does production fall off in the afternoon?

To answer these questions thirteen test periods were introduced.

The first test period made it possible to get an accurate measure of each girl's production under typical work conditions. The second test period attempted to determine the effects of a change in work place upon production. The third period introduced a change in the method of payment; the six girls were paid directly according to the output of their own group, whereas previously they had been paid on the basis of the production of the entire group of about 100 operators.

In the fourth period two rest pauses of five minutes each were introduced. In the fifth, these rest pauses were increased to ten minutes. Period 6 had six rest pauses of five minutes each. In period 7 two rest pauses were given and a "free mid-morning lunch" was added. The morning rest was fifteen minutes and the afternoon one was ten minutes. Period 8 had working conditions similar to those in period 7, but the working day was a half-hour shorter. Period 9 was the same as period 8, but the workday was shortened another half-hour. Period 10 returned to the conditions in period 7; that is, the day was one hour longer than in period 9. In period 11 the group went on a five-day week. Period 12 saw the group return to the conditions of period 3—no rest periods, no free lunches, and a full work week. Period 13 was essentially a repetition of periods 7 and 10 except that the operators furnished the morning lunch and the company supplied the beverages.

The variation in conditions produced extremely interesting results. The production of these girls climbed. Each test period had higher production records than the preceding one. Fig. 3 and Table 2[2] present the general results.

However, to present the results of the second study in such an objective form as production records is to lose sight of the meaning and implications of the study. The important qualitative aspects will therefore be summarized.

Periods 1 through 3 successfully accomplished the transfer of the girls from the factory to the test-room situation. A group formation began to take place among these girls. They were allowed to talk more freely, and the supervisor's role, as they had known it, changed.

The second phase carried through four test periods and was mainly concerned with rest pauses. Although, on the

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[2] Figs. 2, 3, and 4, and Table 2, are reprinted by permission of the publishers from F. J. Roethlisberger and William J. Dickson, *Management and the Worker—An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago,* Cambridge, Mass.: Harvard University Press, 1939.

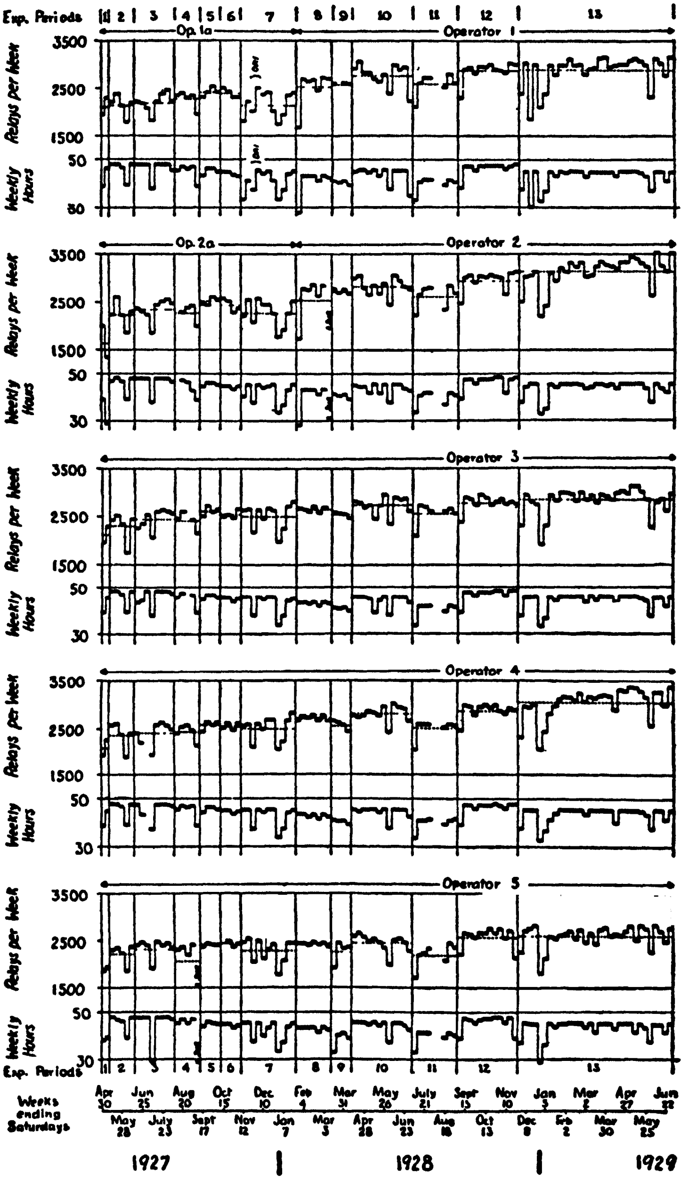

FIG. 3. Total Weekly Output, Experimental Periods 1-13, Relay Assembly Test Room.

TABLE 2. Relay Assembly Test Room data

Period	Length in Weeks	Experimental Conditions of Work	Experimental Working Hours per Week[a]	% Decrease from Standard Working Hours
1.	2	Standard	48	
2.	5	Standard	48	
3.	8	Standard	48	
4.	5	Two 5-min. rests	47:05	1.9
5.	4	Two 10-min. rests	46:10	3.8
6.	4	Six 5-min. rests	45:15	5.7
7.	11	15-min. rest and lunch in morning 10-min. afternoon rest	45:40	4.8
8.	7	Same as 7, but 4:30 stop	43:10	10.0
9.	4	Same as 7, but 4:00 stop	40:40	15.3
10.	12	Same as 7	45:40	4.8
11.	9	Same as 7, but Sat. morning off	41:40	13.2
12.	12	Standard	48	
13.	31	Same as 7	45:40	4.8

[a] By "experimental working hours" is meant the total time lapse between the official starting and stopping time for the day (standard working hours), from which the time decreases due to the experimental conditions of work listed above have been deducted.

basis of the data acquired, the experimenters believed that a rest period should occur somewhere between 9:30 and 10 A.M., they had no idea as to where to place the afternoon rest pause. In accordance with the general policy followed in the test room, the girls were consulted. The girls suggested that rest periods occur at 10 A.M. and 2 P.M. Some of their comments were as follows:

Operator 1A. Gee, that's the berries! It rests you to have five minutes like that. (To 3) Don't you like it?
Operator 3. Yes, I do.
Operator 4. I like the rest period, but I think one every hour would be better.
Operator 5. It rests you a little bit.

Since output increased even though the rest period reduced the work week from 48 to 47:05 hours per week, the two rest periods were doubled, the work week thereby being reduced to 46:10 hours. An immediate and definite rise in the average output occurred. At this point the girls expressed happiness over the increase in production and earnings but disagreed among themselves as to how to explain it. They also showed some apprehension as to whether they really would receive the increased earnings—one girl said, "We earn 80 per cent but we'll only get 60 per cent." The girls were offered the opportunity of getting their increases once a month but did not like the idea, for they believed that the company would find some way to avoid paying them. The experimenters state that these fears were irrational and unjustified; they sound as if they were proud that the girls were willing to express such fears. Right then they could have realized that the bonus system of payment was involved and that there was distrust. In this experiment the bonus idea was dropped. The implications are important and should be noted.

The girls were then put on six five-minute rest pauses, although they were unanimously in favor of two fifteen-minute periods. They did not favor this workday even though the work week was reduced to 45:15 hours. Typical comments were: "I'm getting 'nuts' on this job." "I don't know what I'm doing." "I feel 'goofy' today." "I don't like these rest periods." "I just get started to work and then have to stop." In period 7 the work week was increased to 45:40 hours and a mid-morning lunch was served. The girls favored this period.

Analyzing individual production records during these first seven periods shows that operators 3 and 4 tend consistently to increase production. Operator 5 tends to maintain production consistently with only one spurt. Operators 1A and 2A are similar in production. Their trend is downward in periods 2 and 3, rises in 4 and 5, and drops in period 7. These two girls had been doing lots of free talking and were considered antagonistic and uncooperative. They were finally replaced in the experiment. This is another important clue that was overlooked by the experimenters.

The third phase of the Relay Assembly Test Room experiment was concerned with a shorter work week (periods 8, 9, and 11). The three remaining periods (10, 12, 13) were checks. The operators were given the choice of starting work a half-hour later or ending a half-hour sooner. They chose the latter unanimously. This brought the work week down to 43:10 hours. Output did not diminish and the girls liked the shorter schedule. Some comments were: "It's fine, and we still make our rate too." "I'll never get tired of it. Last night I had a whole streetcar all to myself." "I like it." In period 9 the workday was reduced another half-hour, the total work week being 40:40 hours. Although the girls were in favor of a shorter working day, this was "too drastic." The total weekly output was lowered. The rate of output did not diminish, but the girls became quarrelsome. Operator 2, for example, scolded the other girls for not working hard enough. In period 10 they returned to the full 48-hour week with two rest periods of fifteen minutes in the morning with free lunch, and ten minutes in the afternoon. They did not like it; they claimed greater fatigue and expressed disinterest in their increased earning capacity. It is interesting to note that this "fatigue" was not mentioned in period 7, which was identical.

At this time the girls were given a questionnaire on health habits and psychological attitudes. They reported that they felt better in the test room but gave varied reasons. In answer to the question, "What do you think has made it possible for you to increase your earnings since you have been on the test?" they replied: "Greater freedom"; "absence of bosses"; "more personal attention"; "opportunity to set one's own pace." Further questioning brought out the fact that freedom from rigid and excessive supervision was the important factor in determining the girls' attitude toward work. In other words, rest pauses, a free lunch, a shorter work week, and higher pay did not, in the minds of these girls, count for as much as freedom from such supervision.

Period 11 introduced the five-day week with the same rest pauses as in period 7. The girls were paid the basic hourly wage for the hours not worked on Saturday. No clear-cut drop in production was apparent; but since this period was disrupted by vacations, it is possible that it was introduced mainly as a "marking-time" period for all concerned. This is unfortunate in view of the popularity of the five-day week now, but in 1928 this was not so prevalent. Again, the experimenters missed an important clue.

Period 12 returned to the full 48-hour week without rests. The girls were informed that this period would last about three months and were asked to work in their normal fashion. Although the average hourly output dropped, total production reached the highest peak of any period. However, the girls took their own rest pauses during this period. They would eat candy and get thirsty, so they went to the drinking fountain; in addition, there was much laughing and boisterous joking. The girls still liked the test room better because they could scream and have fun and because they had no bosses. Operator 3 at this stage told the test-room observer to "shut up."

In period 13 the rest periods were resumed. The girls furnished their own lunch, but the company furnished the tea. During this period it was observed that instead of antagonistic competition the girls worked toward a common goal. If one girl slowed up because she felt ill, the others would speed up. The total weekly output rose.

Since a careful record of "personal time" out taken by employees was kept throughout the experiment, there is clear-cut evidence to show that organized rest periods decreased this personal time out but also decreased the work week. For example, in periods 3 and 12 (no rest periods) personal time out averaged fourteen minutes. In periods 7, 10, and 13 with twenty-five minutes of rest periods it averaged seven minutes. In other words, the working day was shortened by eighteen minutes instead of twenty-five minutes. Physical examinations showed that the health of the employees was not impaired during this study. Absenteeism for these six operators while working in the factory averaged 15.2 irregularities but dropped to 3.5 irregularities in the test room. This is most probably to be attributed to a change in employee attitude.

The girls liked the work week with no Saturdays best of all. (Next they preferred the 4:30 P.M. stop with rest and lunch.) The experimenters report that it is doubtful if the girls would have been unanimous in their approval had they not been paid for Saturday morning off. The present writer does not understand the doubt on the part of the experimenters.

During the course of this experiment the girls' attitude toward those in charge of it changed continually. In the early stages there was apprehension and fear. This finally disappeared as a result of the fact that the girls were consulted and informed about the various stages. By period 13 they liked the test room and its pleasanter, freer, and happier working conditions. In other words, they preferred the lack of restraint and excessive supervision. The test-room observer was regarded as a friendly representative of management and not as a supervisor who "bawls us out."

Another change that took place was the solidifying of the group. Four of the girls started going out with each other and all of them helped the others with their work. They no longer worked as individuals.

The experimenters were perplexed by the general trend toward increased production independent of rest pauses and shorter hours and by the improved mental attitude of the girls. Five tentative explanations were suggested to explain these facts:

1. Improved material conditions and methods of work.
2. Shorter hours, which provided a relief from cumulative fatigue.
3. Shorter work periods, which provided a relief from monotony.
4. Wage incentive plan.
5. Changes in method of supervision.

The first explanation was dismissed. T. N. Whitehead, who analyzed the entire body of data (*6*), finds no conclusive evidence to support it. There were no significant correlations between physical conditions and production. The second and third explanations were dismissed after careful examination of the daily work curves of the operators. There was no evidence that these curves resembled fatigue curves, and only one operator's work curves showed a resemblance to the monotony curve.

In order to establish the truth or falsity of the wage incentive as an explanation, two minor studies were made. These were known as the Second Relay Assembly Test Room and the Mica Splitting Test Room. The original Relay Assembly Test group had a change of environment as well as of payment, whereas the Second Relay Assembly group had only a change of payment. Five experienced operators were put on a payment basis similar to that of the original group but were kept in the factory. This group increased production almost immediately by 12 per cent and they continued at this level; but when they went back to the original method of payment there was a drop. These facts were interpreted by the experimenters to mean (1) that the formation of a small group to determine piecework earnings was an important factor in the Relay Assembly group and (2) that subsequent rises in test-room production could not be explained in terms of this factor alone. A very important point is that the morale of the entire department was shattered. The other operators wanted similar consideration (and possibly the chance to earn more money). Because of the friction in the department, this experiment had to be discontinued.

In the Mica Splitting Test Room experiment the basis of wage payment remained at the same individual piece rate, but changes in working conditions similar to those in the test room were made. The primary purpose was to study the effects of the change in payment in the test room. Five operators took part in the experiment; two were selected at random and they chose the other three. Their production rose an average of 15 per cent in fourteen months. In the Second Relay group production rose 12 per cent and the Relay Test Assembly Room rise in output averaged 30 per cent. It can be assumed that 15 per cent is the maximum that can be attributed to a change in financial incentive; the remainder must be attributed to other factors. The experimenters present two conclusions based upon the evidence:

> 1. There was absolutely no evidence in favor of the hypothesis that the continuous increase in output in the Relay Assembly Test Room during the first two years could be attributed to the wage incentive factor alone. 2. The efficacy of a wage incentive was so dependent on its relation to other factors that it was impossible to consider it as a thing in itself having an independent effect on the individual. Only in connection with the interpersonal relations at work and the personal situation outside work, to mention two important variables, could its effect on output be determined.

By period 13 the experimenters realized that they had not studied the relation between output and fatigue, monotony, etc., but had performed a sociological and psychological experiment. By trying to control variables they had introduced a new one, a social situation that involved changed attitudes and interpersonal relations.

The chief result of years of work had been to demonstrate the importance of employee attitudes. For management, however, there were other practical results. They introduced rest pauses on a wide scale. They began to question many assumptions they had previously made and they realized the errors of oversimplification. They saw that one could not predict the effect of a single factor if it was part of a total situation. They also realized the importance of gaining more knowledge about employee attitudes; this led to Study 3.

STUDY 3. MASS INTERVIEWING PROGRAM

Study 2 allowed the surmise that a relation existed between employee morale and supervision. It was believed that an improvement in supervision would improve morale. Since there was a dearth of facts on how to improve supervision and the material that was available was highly opinionated, it was decided to interview the employees in order to secure information. The Relay Assembly Test Room experiment showed that the employees were exceedingly disparaging about the supervision, whereas management had believed that the supervision, especially in this department, was good. This raised the possibility either that management knew little about what constitutes good supervisory methods or that they knew nothing of the employee attitudes on the subject. Thus in this experiment the emphasis shifted from a study of changes in environmental work conditions to a study of human relations or of attitudes concerning human relations.

The Relay Assembly Test Room also showed that as the girls' attitudes improved toward each other, their work, the supervisor, and the company, their production increased. In other words, their morale affected their production. The company had been conducting supervisor training courses and it decided that instruction in improving employee morale should be part of this course. Five meetings were planned, but two sessions made it clear that no factual data were available for this purpose. Consequently, as has been said, it was decided to interview the employees.

The interviewing program was launched in the inspection branch, in which about 1600 workers were employed. Three men and two women supervisors were chosen to conduct the interviews; they were told that the purpose was to gain information about employee attitudes, *not* to spy on supervisors or anyone else.

The first interview was conducted as follows:

1. Each interviewer was assigned a certain territory to cover. From the foreman of each department in his territory he was to obtain a list of the employees' names.
2. When the interviewer was ready to start interviewing in any department, it was recommended that he first go to the foreman in charge and make his presence known.
3. It was recommended that the interviewer select the man he wanted to interview because otherwise the supervisor might be tempted to give him all his "problem cases" first. However, the interviewer was to cooperate with the supervisor so that the operation of the department would be interfered with as little as possible.
4. The interviewer was to ask the supervisor's advice about where the employee should be interviewed—whether away from the job or on the job. (Subsequent experience showed that it was usually advisable to interview an employee away from his work. Thereafter it was recommended that the interviewer ask the department chief for a bench or desk where he could conduct the interviews without interruption.)
5. The interviewer was to make sure that the necessary arrangements were made for paying the employee his average earnings for the time consumed in the interview.
6. In his contacts with supervisors the interviewer was to be careful not to betray the confidence of any employee and

to refrain absolutely from discussing the content of the interviews with the supervisors.

7. Only a few employees from any one location were to be interviewed on the same day, so that the work of the department might go on normally and without undue confusion or curiosity.[3]

Careful instructions with regard to approaching the employee and conducting the interview were also given the interviewers:

1. Whenever possible, the employee was to be formally introduced to the interviewer by the supervisor. Interviewers were not to interview employees whom they knew, because the acquaintance might influence the employees' comments.
2. When the interviewer and employee were seated and ready to proceed with the interview, the employee was to be told the interviewer's name again.
3. The interviewer was to explain to the employee the purpose of the interview, i.e., why any comments, either favorable or unfavorable, that the employee cared to make about his supervisors, working conditions, and job were being solicited.
4. The employee was to be told how the interviews would be used; for example, any complaints he had about working conditions would be investigated together with those of the other employees, and, as far as practicable, remedial action would be taken. The manner in which the material gathered from the interviews was to be used in supervisory training conferences was also to be explained.
5. The interviewer was to make clear to each employee that the interviews would be kept strictly confidential; i.e., the employee could tell the interviewer anything, no matter how bad it was, without getting in trouble himself or getting his supervisors or his co-workers in trouble. The interviewer was to explain that no names or company numbers would appear on any records and that the people who read the interviews or heard them read would not be told who the employee was or where he worked. Anything the employee said which might

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[3] *Ibid.*

identify him with his supervisor would be deleted from his interview.

6. The employee was to be told that the company was as much interested in the things he liked as in those with which he was dissatisfied and which he thought needed to be corrected.

7. The interviewer was to take almost verbatim notes as the employee talked. He was to explain to the employee that he was writing down what was said word for word so that there would be no possible chance of misrepresenting or forgetting anything. (At first it was thought that taking notes might make the employee reluctant to talk, but this was found not to be true.)

8. The interviewer was to be sympathetic and a good listener, and to let the employee know that he was really interested in his problems and complaints.

9. Strict care was to be taken to express no agreement or disagreement with the complaints the employee made. The interviewer was to let the employee know that he himself was in no position to judge the correctness or incorrectness of what the employee was saying.

10. The interviewer was not to inform the employee of the nature of the complaints made by other employees.

11. The interviewer was not to give the employee advice as to what he should do. In rare cases he might advise an employee to see his supervisor, or tell him about the various benefit plans, the Hawthorne evening school, or similar things. However, the interviewer was not to hesitate to offer encouragement to any employee if he thought it would do him good.

12. The interviewer was to write up the interview under six headings. The opinions of the employee were to be divided first into three categories: working conditions, supervision, and job. Each of these headings was to have two subclassifications, likes and dislikes.[4]

The reaction of the employees to this program was generally very favorable. A typical reaction was, "It is a good idea to interview the operators, as they may have something in their minds that they want to talk over with someone and this gives them a chance to do it." Another type of reaction was, "I never really thought this interviewing amounted to very much, but since you explained it to me I see where I can tell you something that may help in the supervisors' conferences." Other reactions were illustrated by still another type of response: "Now maybe some of the people will take a hint and learn that they have not been doing the right thing, especially some of these underhanded bosses. I hope they get their share of this."

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[4] *Ibid.*

Some employees attributed changes in conditions to the interviews when in reality the only change that occurred was in the attitude of the person interviewed. For example, one woman believed that the food in the cafeteria was better. Some employees, on the other hand, believed that management would make no changes at all; a few were very suspicious.

Naturally, one should expect all types of reactions to an interviewing program, and this was no exception. The success or failure and the final total reaction depend entirely upon whether the employees understand and endorse the real purpose and whether the company's actions conform to it. Because in this instance they did, it was possible to obtain a tremendous amount of information that could not have been secured in any other way. Not only was employee reaction favorable, the reaction of the supervisors was also. One quotation illustrates this: "Did you go to the last conference we had? Say, they are getting to be good. You know, I am getting a lot of help from them. I am learning to see the operator's viewpoint of things, and really believe I am learning to do my job much better by attending these conferences."

Another outstanding aspect of this part of the Hawthorne Studies was its flexibility. The program was expanded and the method of conducting interviews under-went drastic changes as the facts became known. Although originally the interviews were not meant to be of the questionnaire variety, there nevertheless was a typical way of beginning each interview and during its course specific points were covered by direct questions.

At conferences it was reported that employees often discussed irrelevant topics, that is, irrelevant from the point of view of the subject matter the interviewers were to cover—supervision, working conditions, and the job. Since this happened fairly frequently, it was decided that these discussions were not irrelevant at all. Analysis showed that direct questions put the employees in a "yes or no" frame of mind, often impeded the progress or the interviewer, and inhibited the spontaneous expression of their real convictions.

As a result, the interview procedure was changed to the "indirect method." The employee had considerable freedom in choosing his own topic at the start of the interview and the interviewer allowed him to continue to talk. This change in technique resulted in the average length of the interview increasing from a half-hour to one and one-half hours. The material on which the report was based also increased from two and a half to ten pages. When the program was suspended because of the depression, 21,126 employees had been interviewed.

The ramifications of the various phases of the interviewing program were many. The interviews had a real effect on the company's supervisor training courses. It provided management with a list of complaints about specific environmental conditions that could be investigated. Data concerning employee attitudes and opinions were made available on a large scale. It was also found that the employees benefited psychologically merely as a result of being interviewed.

However, certain perplexing problems arose as a result of the program. For example, employees reacted differently to the same surroundings. Thus some expressed satisfaction with the same thing that others considered unsatisfactory. Comments during the interview were expressed as either fact or sentiment, but often no distinction was made in the mind of the person being interviewed. In other words, the employees were reacting to a personal situation on the basis of their previous social conditioning. Further, they were responding as part of the social organization of the group in which they worked and in relation to their position in this group.

The program showed that such items as wages, hours of work, and physical conditions could not be considered as factors in themselves. Instead they should be considered as carriers of social values. They could be understood only through the acquisition of information about the individual's position or status in the group in which he worked and in the company as a whole. Thus the meaning assigned to wages, hours of work, locker rooms, etc., varied according to the employee's position in the group, the group attitude toward the specific item, and his relations with people outside the job.

From this it followed that information should be obtained not only about the individual's attitudes and opinions, but about the social groups that existed. Evidence acquired in this phase of the study indicated that these groups, about which management knew nothing, could exercise considerable control over the work behavior of the individual members. Restricted output, which often occurs in industry, was found to exist in the plant. Hints indicated that it was probably the result of the formation of social groups and the resulting pressures. There was also some evidence of the development of informal personal leadership in these groups. The existence of this type of leadership was not recognized by management, even though it was likely to be as important as any other factor—in some cases more so—in the group's acceptance or rejection of management's regulations. It was in this setting that the fourth study was begun.

STUDY 4. BANK WIRING OBSERVATION ROOM

THIS part of the Hawthorne Studies attempted to obtain more exact information about social groups within the company. The preceding study had progressed from the proposed guided interview to a more intensive type of unguided interview, and then to a series of interviews with one person. In it, the emphasis was on obtaining information from large numbers of employees. The last phase of the program pointed to the need to go back to a study of the Relay Assembly Test Room type, in which information of an intensive nature would yield data on the social groups in existence. The reports of two of the interviewers will serve as a good introduction to the fourth of the Hawthorne Studies.

> They [the employees] firmly believe that they will not be satisfactorily remunerated for any additional work they produce over the bogey, or that if they do receive more money it could only be for a brief period, at the end of which the job would be rerated. Because of the belief that rates may ultimately be lowered if output is too great, there seems to be a tacit agreement among the members of this group to limit their production to the bogey requirements on each operation. Seldom do they exceed the bogey by a large margin. Most of the work is turned out in the morning in order that they can "take it easy" during the latter part of the afternoon. When questioned as to whether or not their earnings would be greater if they turned out more work, they claimed that the difference, if any, would be negligible because the percentages made by the other groups tend to pull theirs downward. To this general scheme all their attitudes and behavior are related.
>
> The leader in this group is one of the two group chiefs, undoubtedly a very significant factor in giving the group a strong feeling of security. This supervisor, A, was at one time on the bench in the same group which he now supervises, but

he refused to allow the change to alter his relations with the men. From observing the group one can hardly draw a line between supervisor and employees. It is obvious that he is very popular with them; no one has any adverse criticism to make of him. He is very close to the men, keeping them well informed at all times as to the group standing in the department, i.e., relative percentages, rates, output, etc. When asked why they consider him a good supervisor, his men replied with such statements as: "He knows his stuff," "He's fair and impartial," "He'll go to hell for you and make sure you get plenty of work." In short, all their statements implied a firm conviction that this group chief would protect their interests. By way of contrast, while A was on sick leave, another supervisor, B, took over the group. Toward B the employees expressed strong antagonism. B is an older man, further removed from the interests and sentiments of his subordinates. He is not quite trusted by the men and commands very little respect. As one employee sized him up, "When he bawls you out, he is more nervous than you are." This group is only vaguely conscious of the other supervisors in the department; in fact, a confusion of the supervisory ranks is quite evident. For example, C, a section chief, has held the same position for a number of years; but the men cannot figure out what position he holds in the department, who reports to him, or what his duties are.

An attitude common to this group, but existing in varying degrees of intensity, may be characterized as a lack of ambition and initiative and a complacent desire to let well enough alone. Most indifferent is their attitude toward advancement, referring, of course, to promotion or higher-grade work. Whereas it is usual in any group to find several employees striving to improve their position, here only one or two seem to be interested. The others merely say, "All we are here for is the old pay check." Sometimes they speak of the department as the "Old People's Home" because, quoting one man: "The fellows get in here and don't seem to want to get away. Take a fellow like me. I have been on this job ten years. If I was transferred out, I would have to start all over again and I would have a pretty tough time."

> In their group life they are congenial and happy-go-lucky. This is obvious not only during rest periods but also while they work. Side play is frequent, and good-natured bantering constantly flashes back and forth. During rest periods everyone either plays cards or stands by as an interested spectator, and in these games rivalry is always keen but congenial. Several of the newer men express the consensus of opinion by describing their associates as "a swell bunch of guys."[5]

Another investigator reporting on a different group tells a different story.

> A says B gets mad because he (A) does too much work: "B sometimes tries to do as much as I do, and whenever he can't make it he gets mad and swears about it. Then he will go over to some of the others and say that I am trying to kill the bogey." The girl assemblers in the group tell A that he should not stand for the treatment he gets from the group chief. They tell him he does the most work and gets the least recognition.
>
> A mistrusts D because D represented himself as a sort of a supervisor to A and took the easy jobs when A first came to work here. He is not friendly with E because E does favors for everyone but him. His friends are an old man, G, and the girls. When B was called to the office because his production was too low, A told him it was his own fault. B then said, "What! Do you expect us to come down here and slave?"
>
> B is 36 years of age, a rather stocky, well-built, athletic type. Although he supports his father and mother, their dependence apparently serves to accentuate his own manhood. He says that the supervisors are all satisfactory. He knows them well because he has worked here so long. He takes a senior position in the group and gets along well with everyone but A. His attitude toward A is indicated by the incessant "kidding" to which he subjects him. He attributes to himself all the best characteristics of virile manhood and attributes to A feminine characteristics. He says that A is an hermaphrodite. He demonstrated in the first interview how A swings his hips and carries himself like a woman. B thinks that A works hard because he is "dumb," and that nobody likes A because he does so much.

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[5] *Ibid.*

He explains that A sits all by himself (in reality he sits next to B) and nobody will talk to him, so all he can do is work from the first whistle to the last. B was once offered a position as supervisor which he refused.[6]

The need for a more systematic inquiry resulted in the selection of 14 male operators who were to work under standard shop conditions. These workers were observed and interviewed over a period of six and a half months; the study was terminated when work ceased because of the depression. This group of men were reluctantly assigned to a separate room. By this time the researchers knew that such a change is often of importance; however, it enabled better control of the study. The observer was stationed in the room; he was to assume the role of a disinterested spectator but was not to set himself off from the group. He adhered strictly to the following rules: (1) Give no orders and in no way demonstrate authority. (2) Do not take part in arguments. (3) Do not enter into conversation nor seem overanxious to hear about what is going on. (4) Never violate confidences of employees.

The observer was asked to note the formal organization of supervisor and employees, and also all informal groupings of the men. Further he was to observe the interrelations of these two types of organizations. The interviewer did not enter the test room. His function was to gain insight into the workers' attitudes, thoughts, and feelings, whereas the observer was to describe the actual verbal and overt behavior of the group. Working thus together, these two were to gather data from this group concerning the department, the company, and the community.

The workers in the Bank Wiring Observation Room study consisted of three groups: 9 wiremen, 3 soldermen, and 2 inspectors. Each did a specific task but necessarily collaborated with the others. This department was chosen because it met such criteria as (1) the sameness of the task; (2) exactly determinable output; (3) shortness of task (one minute required); (4) work pace determined by operator; (5) assurance of continued work; (6) the ease of removing the group as a unit from the department; (7) the experience of the operators. These criteria were similar to those used in the Relay Assembly study, but from this point on there was a difference.

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[6] *Ibid.*

The men were invited to cooperate in the study. The first week they worked or appeared to be working all the time. They were cautious toward the observer. When they complained to him about poor lighting, he told them that he had no authority and suggested that they refer all complaints to their supervisor. It was three weeks before the men started to relax and behave more as they did in their regular department. It was learned that these men did not think that either the group chief or the section chief had much authority. The foreman spent little time in the room so they were relatively free from authority.

The system of payment was a complicated wage incentive plan that had been instituted to promote efficiency by encouraging production; it was also believed to be a fair means of apportioning employee income. It was soon found that this wage plan was not working. The workers defined a day's work as the complete wiring of two units and either they stopped before quitting time, or they paced themselves to last out the day. No uniform explanation or reason was forthcoming for this definition of a day's work by the men, but it completely invalidated the incentive plan, as the following conversations prove:

> W_2 (After claiming that he turned out more work than anyone else in the group). They [his co-workers] don't like to have me turn in so much, but I turn it in anyway.
>
> (In another interview). Right now I'm turning out over 7000 a day, around 7040. The rest of the fellows kick because I do that. They want me to come down. They want me to come down to around 6600, but I don't see why I

should. If I did, the supervisors would come in and ask me what causes me to drop like that. I've been turning out about that much for the last six months now and I see no reason why I should turn out less. There's no reason why I should turn out more either.

W_8. No one can turn out the bogey consistently. Well, occasionally some of them do. Now since the layoff started there's been a few fellows down there who have been turning out around 7300 a day. They've been working like hell. I think it is foolishness to do it because I don't think it will do them any good, and it is likely to do the rest of us a lot of harm.

Int. Just how do you figure that?

W_8. Well, you see if they start turning out around 7300 a day over a period of weeks and if three of them do it, then they can lay one of the men off, because three men working at that speed can do as much as four men working at the present rate.

Int. And you think that is likely to happen?

W_3. Yes, I think it would. At present we are only scheduled for 40 sets ahead. In normal times we were scheduled for over 100. If they find that fewer men can do the work, they're going to lay off more of us. When things pick up they will expect us to do as much as we are now. That means they will raise the bogey on us. You see how it works?

Int. You say there is no incentive to turn out more work. If all of you did more work, wouldn't you make more money?

W_4. No, we wouldn't. They told us that down there one time. You know, the supervisors came around and told us that very thing, that if we would turn out more work we would make more money, but we can't see it that way. Probably what would happen is that our bogey would be raised, and then we would just be turning out more work for the same money. I can't see that.

W_5. There's another thing; you know the fellows give the fast workers the raspberry all the time. Work hard, try to do your best, and they don't appreciate it at all. They don't seem to figure that they are gaining any by it. It's not only the wiremen, the soldermen don't like it either. . . . The fellows who loaf along are liked better than anybody else.

Some of them take pride in turning out as little work as they can and making the boss think they're turning out a whole lot. They think it's smart. I think a lot of them have the idea that if you work fast the rate will be cut. That would mean that they would have to work faster for the same money. I've never seen our rate cut yet, so I don't know whether it would happen or not. I have heard it has happened in some cases though.

W_6. (Talking about a relative of his who worked in the plant). She gets in here early and goes ahead and makes up a lot of parts so that when the rest of the girls start in she's already got a whole lot stacked up. In that way she turns out a great deal of work. She's money greedy. That's what's the matter with her and they shouldn't allow that. All she does is spoil the rate for the rest of the girls.

Int. How does she do that?

W_6. By turning out so much. When they see her making so much money, they cut the rate.

W_7. There's one little guy down there that turns out over 7000 a day. I think there's a couple of them. And we have to put up with it.[7]

The men devised various means of controlling production. Name calling and minor physical punishment were two of the more common ways of restricting output. Workers who produced too much were nicknamed "Slave," "Speed King," or "Phar Lap" (a champion race horse of that year). They were also "binged." A "bing" is a very hard blow on the muscles of the upper arm. The one who is hit never protests but is allowed to "bing" back.

The men's concept of their average daily production was reflected in rather constant weekly production figures. The men achieved this constancy by reporting more daywork allowances than they were entitled to. In addition they sometimes reported more—or in some cases less—production than they had actually turned out. The primary reason for this was to gain group acceptance.

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[7] *Ibid.*

Three men always reported more work than they actually produced, and two reported less; the others varied their reports. A comparison of morning and afternoon production showed that the faster men slowed down in the afternoon, whereas the slower men worked at a more even pace. Briefly, the findings were that the men were restricting production in accordance with their definition of a working day, thus nullifying the validity of the wage incentive plan. Interpersonal relations apparently were more important than the wage incentive.

The group chief had certain difficulties. In the first place he had to handle the day-work claims of the men. These claims were made to justify being paid at an hourly rate rather than on a production basis. Company rules allowed such claims and they could be made for any number of reasons. The group chief had either to accept these claims as justifiable or be arbitrary in rejecting them. He chose to accept them and thereby gained the good will of his men. It would have been difficult to prove any of the reasons given as being incorrect or unwarranted.

Another problem was job trading. The only excuse for this was physical incapacity, as when a solderman developed a sore finger. Determining how sore a "sore" finger has to be made this a difficult claim to dispute. Thus the group chief was sympathetic to his men and steered a middle course, and he, in turn, was popular with them. During this study he was demoted because of business conditions and a group chief with greater seniority took over. The new one placed great stress on conduct and efficiency. The men thought that he was exercising more authority than was vested in him, nor did they admit his authority merely because he exercised it. Certainly the first group chief with his leniency received more cooperation than the second one.

The next representative of management was the secti
chief, and since he supervised a number of groups, he was

never in close contact with any one group at all times. His function was more managerial and he was considered to be more "in the know" than the group chief. Even though the men argued freely with him, they regarded him as having more authority than the group chief. The assistant foreman, next in the management hierarchy, was listened to with respect, but the men never argued with him. If they disliked what he said, they waited until he left to voice their opinions. The relations of the assistant foreman to the group were pleasant. The foreman was called the "old man." When he came in, conversation stopped and no one knowingly broke any of the rules. The men showed apprehension while he was present.

Considering the management-employee situation, it was apparent that although communications traveled down in the form of orders, the two first-line supervisors were likely to be questioned. But there was a gap in communications on the way up from employee to foreman. Consequently the foreman and top management were unaware of the reasons for the failure of the financial incentive. The fact that the men reacted differently than had been assumed made the incentive plan ineffectual and was something the supervisory organization could not remedy.

The relations between the employees were especially interesting. The men worked according to "their standard" of production, but in addition they talked, argued, played games, matched coins or indulged in other forms of gambling, formed cliques, took sides, traded jobs, shared candy, insulted one another by belittling nationality and religion, and helped one another in their work. They nicknamed each other "Runt," "Shrimp," "Jumbo," and "Goofy." Their conversation ranged from work to women to horse racing. In short, they did many things together, in addition to working.

The connector wiremen, even though their rates might be the same as the selector wiremen were paid, represented the "elite." Going on connectors was a step forward, whereas being put on selectors was regarded as a demotion. The wiremen occupied a social position above the soldermen. Job trading between them originated most often with a request from the wiremen. The soldermen wore goggles which they resented, and the wiremen demonstrated their superiority by expressing disapproval when the soldermen did not wear them. Lowest was the truckman who transported materials. He was the butt of much horseplay.

The inspectors belonged to a different group. They were responsible to a different set of supervisors. They were not an integral part of the group and were considered outsiders.

A subtle manifestation of status appeared in the way the men dressed. The foreman and assistant foreman wore coats and vests. The section group chiefs wore vests but no coats. The men wore neither coats nor vests. When the men reported for interviews they did not put on their coats, but the inspectors put on both coats and vests.

During lulls in activity the men played games. It was interesting to note that two groups always formed. Group I consisted of four wiremen, a solderman, and an inspector. This group usually gambled. Group II, not as completely set, consisted primarily of one solderman and three to five wiremen. They preferred "binging." The third solderman and the other inspector were isolates, that is, not in either group. These groups or cliques carried over from games to job trading, quarrels over opening and closing windows, and friendships and antagonisms. Furthermore, Group I regarded itself as the superior or "front-room" clique. They felt that their talks were on a higher plane, they ate chocolates rather than "junk," and they were less boisterous.

A diagrammatic summary of the internal organization is shown in Fig. 4.

There were four main determinants of clique membership: (1) you should not turn out too much work (rate busting); (2) you should not turn out too little work (chiseler); (3) you should not tell a supervisor anything that would harm an associate (squealer); (4) you should not act officiously (this applied to inspectors and group chief as well as workers).

This intricate social organization served to protect the group both inside and outside. Control inside was obtained through ridicule, sarcasm, and "binging." Protection outside was afforded by excessive day-work claims and constancy of production. It has already been noted that management knew nothing about the group and its attitudes toward production and management rules until this phase of the study uncovered it. All companies, large and small, have such a setup and under usual conditions they have no way of knowing about it.

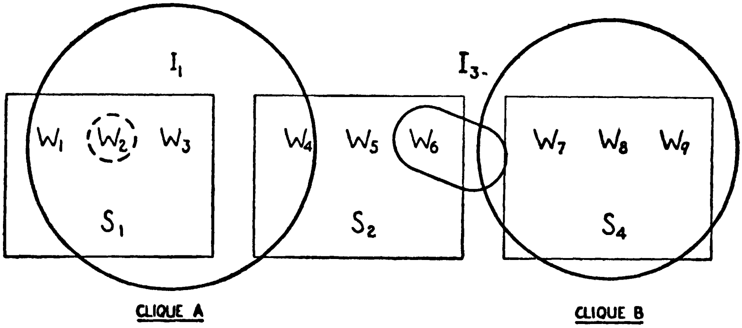

Fig. 4. Internal Organization, Bank Wiring Observation Room.

STUDY 5. PERSONNEL COUNSELING

The Personnel Counseling study was not begun until four years later, because of the depression. However, these four years allowed for an appraisal of the vast significance of this series of unique studies in industry. The Experiments on Illumination showed that there was nothing resembling a close relationship between a change in physical environment and production. The Relay Assembly Test Room with its continuous rise in production, regardless of the changes, showed the importance of employee attitudes toward job, supervisor, and home. The Mass Interviewing Program not only brought about improved methods of interviewing but uncovered much data on specific attitudes, as when it showed that similar situations and conditions could be sources of satisfaction to some and of dissatisfaction to others. The suggestion of a group formed by the workers led to the Bank Wiring Observation Room study, with its findings on the intricacies of informal organization and the ways in which this affects production and supervisory relations. It also showed the breakdown in the flow of communication from employee to management; management was free to give orders but completely in the dark as to how they were finally received.

Since all four studies indicate both a lack of accomplishment in really promoting employee relations and the importance of this work, the fifth study may be regarded as the culmination of the experimenters' efforts to bring this important area into focus. There were two objectives. The first was to have a non-authoritative and impartial agency interview employees to diagnose their problems, and work with supervisors on their methods of supervision. The second was to improve the method of communication within the company, in view of·the ample evidence indicating that it was lacking in certain situations when the social organization conflicted with the managerial organization. The plan was put into operation with the announcement that "personnel men" would be assigned to the departments and would be around to talk to the employees. College graduates were recruited for this work and given training in interview techniques. The program which was generally accepted, led to improvement in three fields: personal adjustments, supervisor-employee relations, and employee-management relations. In several cases there were obvious improvements in personal adjustments. Employees showed changes in personality, and freedom from anxiety and other forms of behavior that might be diagnosed as psychoneurotic. The personnel counselors were helpful in making the supervisors see their problems with less emotion and more understanding. Finally, the reports helped management to a better understanding of employee behavior and sentiment so that policies could be formulated that would result in less friction between management and workers.

The Hawthorne Studies are significant because they represent an honest and concerted effort to understand employees, instead of approaching the problem from the managerial point of view of increasing "efficiency" on an economic level. Moreover, they are interesting because they are a type of experiment which is rarely performed in industry. They do not try to define a response as the result of the introduction of change; they recognize that it is a result of the specific change, *plus* the employee's attitudes, his social situation on the job, and his previous attitudes as determined by his personal history and background.

The Hawthorne Studies have been discussed fully because they are important to industrial psychology. They are not to be considered as the "ideal" experiment or the acme of perfection. There are many reasons for being critical and even for calling the researchers naïve. For example, it may be that the end product, personnel counseling, is merely a substitute for a real need of employees to organize. It may be that the vast difference between the Bank Wiring Observation Room and the Relay Assembly Test Room results was caused by the fact that one group was male and the other female. Evidence from other sources indicates that women regard supervisors as more important than do men, and they are also more tolerant toward work conditions, possibly because they generally look upon their job as a temporary stopgap until marriage. Further criticisms are avoided lest the wrong impression be created. The Hawthorne Studies can be considered as the coming of age of the subject just as Münsterberg's work might be considered its birth.

In the chapters that follow, the various topics connected with industrial psychology will be presented. Since reference will be made to aspects of the Hawthorne Studies not presented here, it will be well to keep the main findings in mind, both as a frame of reference and a standard of performance.

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3. Measuring Attitudes in Business and Industry

ALL people have attitudes which result in tendencies to respond positively or negatively to another person, a group of people, an object, a situation involving objects and people, or an idea. Very often the possession of an attitude predisposes the individual to react in a specified direction. This being so, a knowledge of the attitude allows for the prediction of behavior.

An attitude is acquired or learned by the individual, and at times the learning process is so subtle that he may not even recognize the attitude he possesses or truly understand how it was acquired. Attitudes may be rational or irrational, and the possession of intelligence is by itself no guarantee of a larger number of rational attitudes. The individual who has a certain attitude often has to rationalize or self-justify his reasons for it by drawing upon only the illustrations that back it up.

The acquired determining tendency in one's thinking or behavior may be the result of fact or opinion, but for the person who holds the particular attitude this has no real importance. An observer will find that he whose attitude is based on opinion may be more intense about it than one whose attitude formation is based on facts.

In the preceding chapter we saw that the attitudes of employees were significant in determining production, which is usually management's yardstick of efficiency. A more favorable general attitude was apparently the biggest factor in increasing production in the Relay Assembly Test Room. An attitude or belief that increased production would result in decreased rates was the factor that restricted production in the Bank Wiring Observation Room, in spite of a financial incentive plan whose purpose was to increase it.

One of the most fruitful pursuits for the industrial psychologist is to study the attitudes of employees and employers. Although some work has been done in this field, most of it has been aimed at gaining knowledge of employee attitudes. This is understandable, since these studies are usually paid for by employers who are motivated by a desire either to promote efficiency or to iron out some of their difficulties with employees.

Employers, of course, have attitudes on as many things as employees, and the two are usually somewhat different. Employers' attitudes may lead to incorrect assumptions about employees or, sometimes, to employee behavior that is the antithesis of that which was assumed or predicted. Of course, the same is true of employees. There is a need to study employer as well as employee attitudes in order to get more complete insight into the problem of employer-employee relations.

In studying the attitudes of employers and employees, one must not assume the absence of predetermining factors prior to the job situation or, for that matter, prior to the work history. Such assumptions are fallacious and are likely to lead to sterile results. That a person is likely to be a "little liberal" or a "little conservative" before his first job has been determined by the many interacting influences of school, church, home, community, etc. People are likely to favor or reject things in accordance with their background—or, sometimes, in spite of it. Thus, facts are too often interpreted in the light of one's predetermined attitude toward the other fellow's behavior. An employer may believe that his employees are interested only in salary and that they are not concerned with his problems. To prove this, he cites "facts" such as "soldiering," restricting production, willingness to break rules, etc. An employee may believe his employer is interested only in profits and that he treats him with less consideration than he does his machines. He, too, cites "facts" to prove this—low salary, deductions for minor infractions of rules, poor working conditions, and lack of interest in his problem of making a living. Not only is this a situation in which present and immediately past conditions contribute to the respective beliefs, but it is likely to be one that draws upon much of the past life of the individual, especially the part of it that is colored by emotion. The employer with an unfavorable attitude toward his employees is no more likely really to understand them than an employee with an unfavorable attitude toward employers is likely to really understand his own employer. Poor employer-employee relations and industrial warfare are the inevitable impasse. A better mutual understanding of attitudes will not remove emotion from the situation because attitudes are of the very essence of emotions; but it will enable one to predict behavior with more accuracy and possibly to avoid conflict by bringing about changes in attitudes along fruitful lines.

Two additional characteristics of attitudes should be mentioned before we go into the subject of their measurement. The first is that attitudes are not necessarily a result of intelligence or comprehension. They are part of our hedonistic life. Beginning with simple sensory feelings of pleasantness and unpleasantness we develop likes and dislikes. We further develop emotions, moods, and sentiments. When we have an attitude, a like or dislike, a mood, a sentiment, or even an emotion or passion usually accompanies it. A favorable attitude toward a work place means that it is generally a pleasant office or factory and that we like to work there. We might prefer not to accept another job because we are sentimental about the place. We then find ourselves in a favorable mood and at times exhibit various emotional forms of behavior on or about the job.

An unfavorable attitude has similar hedonistic aspects, except that they are unpleasant. We dislike the setup. We are generally unhappy and in a depressed mood, hate our colleagues and bosses, and fly into a rage upon the slightest provocation.

While it is rare that attitudes change overnight, it is nevertheless true that they do change. This is their second characteristic. The fact that attitudes are susceptible to change makes their measurement more practical. To measure attitudes with scientific accuracy is one thing. To understand the formation of attitudes and to attempt to change the factors contributing to it is another. Although ordinarily this lies within the province of social psychology, all too often in the past the social psychologist has avoided the problems in his field that confront industry. It is also true that the industrial psychologist has often overlooked the methods and techniques employed by the social psychologist. Actually there is much overlapping of subject matter in these two fields, and work directed to the free exchange of knowledge and efforts between these two groups of psychologists, even to the point of ultimate integration, would be of great value.

If the industrial psychologist understands the complexities of attitude formation and the mutability of attitudes, he can do a better job in measuring industrial attitudes. Industrial psychology can make use of the techniques that have been developed by psychologists and modify them for the specific purpose at hand. As more work is done in the field, new and better methods will become available.

Attitude measurement is a most useful device in the hands of industrial psychologists. Specific information about job satisfaction and industrial morale can be obtained. The effects of changes in working conditions and environment, incentives, training programs, and many other factors can be measured in more ways than through production records. If the attitudes of employees are known both before and after a change is made, its ultimate success can be predicted more accurately. For example, an employer inaugurates a change—a bonus, a new work bench, or whatever—because he believes his employees will like it. Afterwards he finds that conditions are worse instead of better and accordingly concludes that his employees are ungrateful. This conclusion may be wrong. If he had known their attitudes in the first place, instead of that particular change he might have made one that would have improved their attitudes, with resulting benefits to him and his staff.

METHODS OF MEASURING ATTITUDES

FIVE methods of measuring attitudes, each with its advantages and disadvantages, will be described and illustrated. Which one should be used will often depend upon the person or group upon whom the decision rests. Attitude measurement can be used by an individual employer, a trade association, a union, or an informal employee group. A satisfied staff, a strike call, an expansion of the group, or a series of changes in the plant may result from the facts uncovered. The methods to be described are: (1) impressionistic, (2) guided interview, (3) unguided interview, (4) questionnaire, and (5) attitude scale.

Impressionistic Method. The impressionistic method is non-statistical, in that it does not lead to quantitative knowledge. It is based upon the observation of behavior and attitudes. From the point of view of science, it is the least desirable of the five; and yet because it is a method whereby attitude measures attitude, it is the most widely used. The industrial psychologist can only condone it. It is excusable when regarded as a preliminary to the others or when a very rapid spot survey must be made. The validity of the impressionistic method varies from very low to rather good. It depends to a large extent upon the training of the observer—whether he can remain neutral in the situation he observes, whether his background and identifications preclude the possibility of correct conclusions, and whether the results are forced in a certain direction. Since it is hard to tell who is a saint or a sinner either before or after the report is made, this method has its danger points and must be taken with at least a few grains of salt.

Industrial towns, factory sites, work conditions, and employee morale are often measured by the impressionistic method. An illustration of it—and one which we believe will bring out its chief characteristic—is the author's impressions of Hershey, Pennsylvania, the seat of the Hershey Chocolate Corporation. Numerous visits there have led him to conclude that this is the garden spot of America, at least as far as industrial towns are concerned. It seems to him that the employees are given much more than merely a chance to work for a living, to earn money. This small town contains more opportunity to live and enjoy oneself than does any other town of comparable—and, in many cases, much greater—size. For example, there is a community building that houses the community theater, a little theater, a junior college, a hospital, a gymnasium, a swimming pool, bowling alleys, game rooms, a social room, library, dining room, cafeteria, club rooms, and dormitories. Elsewhere in the town there is a park ballroom, an amusement park for picnicking and riding, trout pools, a zoological garden, a rose garden, playhouses and playgrounds for children, a sports arena, an outdoor stadium, and a department store. The school system is the largest consolidated system in the country, and includes grades, junior high, and senior high—with its academic, commercial, and vocational divisions—an industrial school, and a junior college. There are no tuition fees for any of this schooling. A side light on the school system is the program whereby 1000 orphan boys are housed on nearby farms and taught trades as well as given an education. At 18 they receive a year's supply of clothing and $100 in addition to what they may have saved from their weekly allowance. There is a palatial hotel on the hilltop and an inn, which, although much less pretentious, is clean and well kept. Guests receive miniature Hershey bars. Everything in the town, from the factory to the office building and the homes, is spotless. The people look happy and well fed, and the homes are in good repair. The streets are named after the various items used in the chocolate bars; the only thing that is not named Hershey is the post office.

To compare this with some of the mining towns in the same state is like getting a glimpse of Paradise and its opposite. This impression of Hershey, its factory, and its workers is extremely favorable. However, it is only fair to say that many people, professional psychologists included, who have had the same opportunities to observe the town do not agree with these impressions. To them the entire setup indicates an excessive paternalism, and they feel that the employees have been lulled into a false security and have consequently lost their zeal, ambition, and drive.

The reader may wonder about the possibility of industrial warfare in such a company. The fact is that in 1937 Hershey was the scene of bloodshed. Reference to newspaper files reveals that on March 18, 1937, Hershey signed an agreement with the United Chocolate Workers of America (C.I.O.) recognizing the union as the collective bargaining agent for its members. On April 2, 1937, about 500 Hershey workers went on a sit-down strike; they occupied the main plant and forced a complete shutdown of the company. On April 8, 1937, the front-page headlines read: "Farmers oust 500 sit-down strikers in battle at Hershey Plant. Many injured. M. S. Hershey in tears." Finally, on April 24, 1937, an N.L.R.B. election was held, with 1542 voting for no union and 781 for the United Chocolate Workers.

Depending upon preconceived attitudes, many different conclusions can be drawn from this series of episodes. One might be that it pays to treat employees fairly; another might be that it doesn't. Since the author holds no brief for either generalization—because neither is warranted—it is not necessary to draw any conclusion except to observe that the impressionistic method needs bolstering. More rigid and exacting techniques for measuring attitudes are necessary, and the remaining four supply them. The first two of them are specific types of interviewing used in the measurement of attitudes. They differ in organization and in the type of question asked.

Guided Interview. The guided interview is a purposeful conversation in which the interviewer tries to obtain honest and complete answers to a set number of questions. Like all interviews, it has the advantage of face-to-face contact. The interviewer must abide by certain rules. He must limit his talking to the minimum; asking questions and saying a few words here and there to impress the interviewee with the importance of what he is saying is enough. The interviewer should never argue or give advice; he should have skill in refraining from both of these. He should refrain from expressing his private convictions. He must be sympathetic and encouraging, but make no suggestions.

The interviewer must try to have all his questions answered and he must ask all his subjects the same questions in the same way. The questions must be fair, they must be capable of an answer, and they should not be leading. They must not be embarrassing. A fair and complete record of the interview should be kept. Usually the best time to make this record is immediately after the interview, from sparse notes taken during it. This type of interview is used most frequently in industry when considering an applicant for a job. The employer or his representative may use it in handling group complaints of workers. It has not been employed very often in determining employee attitudes.

The reader must be cautioned about interviewing. It is difficult, much more difficult than one suspects. The pitfalls are many. In the hands of the inexperienced, the interview is likely to turn into a pep talk, a biased series of questions, or an argument.

The guided interview is a relatively expensive method of determining employee attitudes. Unless an experienced person conducts it, the results are likely to be as inaccurate as those obtained with the impressionistic method. To do a survey of 100 employees usually requires from 100 to 200 hours. This time includes planning, preparation, interviews, analysis of data, and the writing of the report. While it is not necessary to argue how much the services of an industrial psychologist are worth, the prevailing scale paid to consultants averages $50 a day, which makes the total cost likely to run between $500 and $1000. This frightens a great many employers and encourages them to use the impressionistic method.

The guided interview is valuable insofar as it yields information on the specific frustrations of employees. It shows what has gone wrong with the beautiful blueprint of organization and communication. It has many other advantages, as the Hawthorne Studies have indicated.

A study by Stagner, Rich, and Britten (*9*), illustrates a guided interview with the "closed" type of answer. In such an interview, the respondent is asked a series of specific questions and is expected to answer with one of a number of answers that are provided. In its most simple form the "closed" type of answer is either "yes" or "no." A group of 159 machine tool workers were interviewed in their homes. Thirty-four brief questions were read to them and the answers were recorded on a five-point scale from emphatic "yes" to emphatic "no." Each interview was short, lasting only about eight minutes. A numerical scoring system was used on which a number between 1 and 5 was assigned each answer. Since 19 questions, according to the authors, were related to job satisfaction, it was possible to get a total score for this attitude. Perfect satisfaction would yield a score of 19 and complete dissatisfaction a score of 95. In this study the range was from 27 to 67, with an average of 43.5, indicating that the average worker in this group was "satisfied" (neutrality would be 57).

Extremely satisfied and extremely dissatisfied workers were then selected on the basis of their scores in an effort to determine the questions that most clearly differentiated these two groups. Some of the questions used in the interview are reported in Table 3, together with the percentage of satisfied workers and the critical ratios (reliability of the difference between the satisfied and the dissatisfied groups defined in a study; a C.R. of 3 or more indicates a statistically significant difference). The main object in presenting this table is to illustrate the type of question asked in a guided interview on job satisfaction. The results are to be considered of secondary importance. (The questions are arranged by their critical-ratio value and not in the order asked.)

The table shows that although a small proportion of the workers were satisfied with their pay this question nevertheless differentiated to the greatest extent the satisfied workers from the dissatisfied ones. Each question in Table 3 can be examined in terms of the way the entire population would probably answer, and thus a list of satisfactions and dissatisfactions can be constructed. It can also be analyzed in terms of the way dissatisfied workers differ

TABLE 3. Factors Influencing Job Satisfaction of Machine Tool Workers
(Ranked in order of importance to them)
$N = 159$

Question	Percentage Satisfied		Critical Ratio Between Extremely Satisfied and Extremely Dissatisfied Groups
	Interviewer A	Interviewer B	
1. Do you feel the factory could afford to pay more?	10	15	6.92
2. Do you like the kind of work you do on your job?	87	80	5.86
3. Do you get as much enjoyment from your work as from your spare time?	48	55	5.77
4. Are you told when you are doing a good job?	40	52	4.47
5. Do you feel allowed to offer suggestions as to methods of improvement?	74	80	3.83
6. Do you believe that the bosses and supervisors are always fair to you?	91	92	3.76
7. Do you think you could do better if given a chance at another job?	44	45	3.48
8. When you make a mistake in your work, do you always get a square deal from those deciding the case?	97	83	3.48
9. Do you feel that your present hours are too long?	67	54	3.30
10. Do you feel sure of your job as long as you do good work?	90	87	3.13
11. Do you feel your pay is fair as compared with equally important jobs in the factory?	75	80	2.96
12. How do you like your foreman?	92	85	2.95

TABLE 3 (*Continued*)

Question	Percentage Satisfied		Critical Ratio Between Extremely Satisfied and Extremely Dissatisfied Groups
	Interviewer A	Interviewer B	
13 Would you rather be sure of steady work at your present job than have the responsibility of being a boss?	60	63	2.28
14. Should the mill where you work be fixed up in light, heat, ventilation, etc ?	79	67	2.22
15 Do you think it makes a difference to the company that you're on the job?	52	56	1.99
16 Do you think the management should tell the men more about when the mill is going to close, reopen, or when new orders are coming through?	51	66	1.50
17 Do you feel free to carry your troubles about your work to your boss?	91	90	1.33
18 Do you feel that orders from your bosses many times disagree with one another?	44	57	0 76
19 Does the boss interfere too much in your work?	94	91	0 59
20 Are you friendly with the men who work alongside of you?	96	98	0 57

from satisfied workers. For example, "pay," "liking the kind of work," and "relation of enjoyment of work and spare-time activity" successfully differentiate the two groups. However, "friendly with the men," "boss interferes," and "bosses' orders disagree" are items that do not distinguish the two groups successfully.

Unguided Interview (Non-Directive). The third method of determining employee attitude is the unguided interview, or the non-directive interview. Although there are differences between the two, for purposes of industrial psychology they can be considered similar.

The unguided interview is characterized by the free nature of the discussion and by the fact that it is the person interviewed who really defines its limits. There are no specific questions that the interviewer must ask; his main concern is to probe and establish the emotional content of the interview. Carl Rogers is one of the leaders in promoting this type of interview as a form of psychotherapy; the reader will benefit greatly by reading his book *Counseling and Psychotherapy* (7).

The Hawthorne group has been responsible for many advances in the application of this technique to industry. One of their contributions is a series of rules of orientation and of conduct. The rules of orientation are as follows:

1. The interviewer should treat what is said in an interview as an item in a context.

1A. The interviewer should not pay exclusive attention to the manifest content of the conversation.

1B. The interviewer should not treat everything that is said as either fact or error.

1C. The interviewer should not treat everything that is said as being at the same psychological level.

2. The interviewer should listen not only to what a person wants to say but also for what he does not want to say or cannot say without help.

3. The interviewer should treat the mental contexts described in the preceding rule as indices and seek through them the personal reference that is being revealed.

4. The interviewer should keep the personal reference in its social context.

4A. The interviewer should remember that the interview is itself a social situation and that therefore the social relation existing between the interviewer, and the interviewee is in part determining what is said.

4A1. The interviewer should see to it that the speaker's sentiments do not act on his own.

The rules of conduct are:

1. The interviewer should listen to the speaker in a patient and friendly, but intelligently critical manner.
2. The interviewer should not display any kind of authority.
3. The interviewer should not give advice or moral admonition.
4. The interviewer should not argue with the speaker.
5. The interviewer should talk or ask questions only under certain conditions:
   a. to help the person talk.
   b. to relieve any fears on the part of the speaker which may be affecting his relation to the interviewer.
   c. to praise the interviewee for reporting his thoughts and feelings accurately.
   d. to veer the discussion to some topic which has been omitted or neglected.
   e. to discuss implicit assumptions, if this is advisable.

These rules are not cited because they are either self-explanatory or above debate, but because they give an idea of the general conduct of the interview. Excerpts from two interviews show both the varied nature of the discussion and the underlying principles involved.

Employee. Things went along pretty well for a long time, although at times I was a little discouraged, as during the time I was laid off for three or four months there were quite a number of changes in supervisors; and when I came back to work in Department —— I was very much surprised.

Interviewer. How's that?

Employee. It seems that it was my destiny to be working for a man who had been my supervisor three times before on outside jobs. We had always got along together then, but there seemed to be a certain coolness developed between us

—why, I don't know—but I did my work and said nothing. His attitude toward me did not get any better and many a time I had reasonable cause for complaint, but I kept still.

Interviewer. Is that so?

Employee. Yes, he used some very abusive language at times. . . . Last year I was hit a terrible blow. My seventeen-year-old girl was taken away from me. She was sick not quite a week. She died of spinal meningitis.

Interviewer. That's too bad.

Employee. Yes, she was a dandy young lady. She would have graduated from high school this February.

My daughter's death caused my wife to have a general nervous breakdown a week after my girl was buried. That meant I had to send her to the hospital right away. In the course of her treatment in the hospital, the doctors advised me that in addition to her nervous condition she was in a very delicate condition. I could hardly believe it, but later on I was convinced. Well, my wife was in the hospital for about nine weeks and then came home.

About seven and a half months after that I was the father of twins, a girl and a boy, and the birth of twins, along with my wife's nervous condition, left her in a very bad shape. She came home from the hospital three weeks after the twins were born. She was unable to walk; in fact, she was almost an invalid. A week or two later, while my other girl who is fifteen years old went to the store and there was nobody else around, my wife made an attempt to walk, and in doing so she was so weak that she fell and knocked one kneecap out of place and injured herself internally. I had to send her back to the hospital. She was there from three to five weeks, I think, and now she is practically an invalid.

I have been advised by the doctors that what she needs the most is rest and quiet, and I am saving every penny so that I may be able to send her to a sanitarium.

Mr. Interviewer, aren't you getting tired of listening to me?

Interviewer. No, indeed I am not. Go right ahead. I am very much interested.

Employee. Well, all the time that I was having this trouble my supervisor, a man whom I worked with twelve years, treated me like a dog.[1]

Interviewer. You feel that there is a little politics played, is that it?

Employee. A little? Well, I think there is a great deal of it, if you are asking me. This friendship stuff, stepping out with the boss, goes a long way around here. A blind man could see that.

Interviewer. You feel that stepping out with the boss gives a person a drag?

Employee. A drag? Say, he is sitting on top of the world. It doesn't make any difference whether he knows anything or not. He is put on a job and is sure to remain there as long as his friend remains a department head. Usually the man has ample time to get experience and with the department head coaching him along, he has probably developed himself well enough so that by the time his friend is transferred he is rather familiar with the job.

Interviewer. You mentioned that you were a supervisor one time. What capacity were you in?

Employee. I was a section head in the X department at one time. I was later made a section head in charge of the Y department.

Interviewer. Were you given any reason why you were taken off this supervising work?

Employee. No, they never told me a thing. They took me off and made me like it. That's what makes me mad. They do these damn things and they never give a fellow any explanation. They put anything they feel like down on this personnel record, and it goes upstairs and the employee never knows what is on that record. I don't see how they can do that. If they put anything on record, I don't see why the employee is not allowed to see it. I think if they would show these things to the employees, an employee would have an opportunity of correcting these wrongs if he only knew

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[1] Reprinted by permission of the publishers from F. J. Roethlisberger and William J. Dickson, *Management and the Worker—An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago,* Cambridge, Mass.: Harvard University Press (1939).

> what they were. When raise time comes along, you don't get a raise and they never give you any reason why. They just tell you that you are doing a good job, to keep it up, that they are very sorry but they didn't have enough to go around. Of course, that's very possible, that everybody can't get a raise every time, but I think they should arrange it so that certain ones would get a raise one time and the others another time. They also tell you that you are not under limit of the job, but they don't give you any more money. I can't figure that thing out.
>
> If a fellow gets up around $50 a week, he is at a standstill. It's been two and a half years now since I have had an increase. I am working just as conscientiously as I ever did. I am always living in hope that the next time I'll get a raise. When a fellow is married and has a family, there are always certain places for your money every week.[2]

The greatest advantage of this type of interview is that when it is conducted correctly the interviewer is fairly sure of getting at what is on the worker's mind and thus is enabled to understand the attitudes of employees. Its disadvantages are that it is difficult to summarize and requires laborious study. It is also time-consuming and costly, and sometimes presents problems that most industrial concerns believe are out of their province.

Questionnaire. The questionnaire lends itself to the mass-production techniques of determining employee attitudes. In some respects there is more similarity than difference between this method and the guided interview. For example, the study by Stagner, Rich, and Britten might just as well have been a questionnaire study. The fact that eight minutes is reported as the length of the interviews means that they went at a very rapid pace. However, it may be that these authors preferred to question the workers in their homes because they felt they would get more honest answers. It is also possible that they wanted

[2] *Ibid.*

workers from various plants or were afraid they would not be given permission to conduct their survey at the plant. In any case, they could have distributed these questionnaires at one time if they could have got the subjects together. On the other hand, the interview usually affords an opportunity for the interviewer to observe the subject's feelings and manner of answering questions. Although these two methods overlap, the questionnaire is more economical because one person can administer it to a large group at one time. This method also has the advantage of eliminating any effect the interviewer may have on the respondent and of not requiring as much experience or training on the part of the interviewer as the other methods do. It has the disadvantage of securing no more information than that provided by the answers to the specific questions and of lacking the spontaneity of the unguided interview.

The use of the questionnaire method in determining employee attitude is exemplified in Kolstad's study (*3*). To study the attitudes of employees in a department store, Kolstad constructed a questionnaire designed to measure the attitudes of certain employees toward specific items and the over-all job morale. He defines morale by listing the following 10 attitudes or beliefs that were expressed by employees with high morale:

1. Feels very sure of holding his job as long as he does good work.
2. Has been made to feel in every way that he is really a part of the organization.
3. Feels that the management does a great deal more than could be expected to maintain good working relationships between him and the people with whom he works.
4. Feels that the management of this store is more interested in the welfare of the people in jobs such as his than are any of the other department stores in the city.

5. Has never been dissatisfied with his job or if he has, such dissatisfaction was hardly ever the store's fault.
6. Believes that this department store treats its employees better than any of the other department stores in the city.
7. Feels that the management is always fair with the employees in jobs such as his.
8. Feels that his immediate superiors are always fair in their treatment of him.
9. Can always find out whether his work is improving or not.
10. Knows of no other department store in the city in which he would rather work if he could get the same job at the same salary in one of them.

Ten multiple-choice questions were used to cover these topics. Each question had five answers, the subject checking only one. A representative question was:

How much does the management do to have good working relationships between you and the people with whom you work?

( ) as *little* as possible
( ) much *less* than one would expect
( ) about as much as one would expect
( ) a little *more* than one could expect
( ) a *great deal more* than one could expect

The questionnaire was scored, the possible scores ranging from +48 to —48. The specific items that were found to be most closely related to morale (as defined by Kolstad) were:

1. Promotion of best-qualified persons.
2. Help available to get results expected.
3. Encouragement to offer new ideas and suggestions.
4. Fair hearing—square deal for grievances.
5. Pay increase when deserved.
6. Invitation to offer suggestions when plans are being made.
7. Freedom to seek advice when problems arise.

8. Reasons given when changes are ordered in work.
9. Information about plans and results.
10. No contradictory or conflicting orders.

The findings of this study, shown in Table 4, are based upon 740 non-selling and 660 selling employees. The table is presented not in order to demonstrate the nature of morale but rather to illustrate how scoring a questionnaire leads to quantitative results. These data indicate that the morale of the employees who sell is higher than that of employees who do not sell. Kolstad finds no significant statistical differences between the scores of men and women, married and single men, or married and single women. He does report statistically significant differences in the scores based on length of service. Thus the group employed one to five years had a lower morale than either the short-term employees or those employed for over five years.

TABLE 4. Average Morale Score

	Selling Employees	Non-Selling Employees
All	22.5	10.5
Men	19.6	11.5
Women	23.6	9.2
Married men	19.0	15.4
Single men	20.1	9.7
Married women	24.2	10.7
Single women	23.3	9.0
Length of service:		
Less than 1 year	22.5	12.3
1–5 years	20.5	6.6
Over 5 years	24.6	12.6

Since the main point of this chapter is to explain the principles of measuring attitudes, a minor comment may be made about the table in the original article. It is incomplete. Kolstad goes to the trouble of reporting averages and standard deviations for twenty groups but does not indicate the number in the subgroups. He merely reports the total number of employees in the selling and non-selling groups. As a result, it is impossible to check the reliability of the differences reported or to compute others. To fail to indicate the number of persons in a group is a serious error in statistical technique.

Kolstad also reports on the specific items investigated. He queried the employees on 34 specific items related to store pride, relations with superiors, promotion, pay, and factors influencing employee results on the job. The four items that he found most closely related to morale among the selling employees are:

1. Promotion of best-qualified persons.
2. Encouragement to offer new ideas and suggestions.
3. Understanding of difficulties of job by superiors.
4. Help available to get results expected.

The four items for the non-selling employees are:

1. Help available to get results expected.
2. Encouragement to offer new ideas and suggestions.
3. Fair hearing—a square deal for grievances.
4. Promotion of best-qualified persons.

Attitude Scales. The fifth and last method of measuring employee attitudes is the attitude scale. Here a series of statements is made and the employee is asked to check the items he believes apply to the company. The scale differs from the questionnaire not only in that statements rather than questions are used, but also in that numerical weights are assigned to each statement in accordance with a previously worked-out procedure.[3] The attitude of the employee can thus be expressed numerically. As in all attitude survey methods, the purpose of the survey must be explained to the employees and they must be assured that their reports will in no way endanger their jobs.

Uhrbrock (*12*) has developed a scale to measure the attitudes of employees. The items in it and the values assigned to each item are shown in Table 5.

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[3] See L. L. Thurstone and E. J. Chave (*11*).

TABLE 5. Statements Used in Uhrbrock's Scale for Measuring Attitude of Employees Toward their Company

Scale Value	Statement
10.4	I think this company treats its employees better than any other company does.
9.5	If I had to do it over again, I'd still work for this company.
9.3	They don't play favorites in this company.
8.9	A man can get ahead in this company if he tries.
8.7	I have as much confidence in the company physician as I do in my own doctor.
8.5	The company is sincere in wanting to know what its employees think about it.
7.9	A wage incentive plan offers a just reward for the faster worker.
7.4	On the whole, the company treats us about as well as we deserve.
6.3	I think a man should go to the hospital for even a scratch, as it may stop blood poisoning.
5.4	I believe accidents will happen, no matter what you do about them.
5.1	The workers put as much over on the company as the company puts over on them.
4.4	The company does too much welfare work.
4.1	Soldiering on the job is increasing.
3.6	I do not think applicants for employment are treated courteously.
3.2	I believe many good suggestions are killed by the bosses.
2.9	My boss gives all the breaks to his lodge and church friends.
2.5	I think the company goes outside to fill good jobs instead of promoting men who are here.
2.1	You've got to have "pull" with certain people around here to get ahead.
1.5	In the long run this company will "put it over" on you.
1.0	The pay in the company is terrible.
0.8	An honest man fails in this company.

On this scale, 3934 factory workers obtained an average score of 6.34. Ninety-six clerks averaged 6.84 and 400 foremen had an average score of 7.19. Care must be exercised in interpreting these results, lest one comes to the conclusion that the attitude of the typical factory worker is exemplified by the statement, "I think a man should go to the hospital for even a scratch, as it may stop blood poisoning." After all, this statement has a scale value of

6.3 and is closest to the average of 6.34. Such a conclusion is of course foolish, because 6.34 is the average of the mathematical weights of all the statements checked by the employees.

In fact, Uhrbrock reports that statements expressing a favorable attitude toward the company were checked by more than twice as many workers as checked the unfavorable statements. In addition to finding that foremen had more favorable attitudes than factory workers, he found that this was truer of women than men and that employees who had worked for the company more than six years were slightly more favorably inclined than those with a shorter period of service. It will be noted that Uhrbrock finds a difference in attitude between males and females, whereas Kolstad does not. This is due to different samples, different levels of employment, and other similar factors.

THE ATTITUDES OF EMPLOYEES VS. THE ATTITUDES OF EMPLOYERS

A REPORT by S. J. Fosdick (2) indicates clearly that employers and employees have different ideas on the subject of morale. Table 6 shows the rank assigned to various factors in morale by these two groups.

TABLE 6. Rank Assigned to Factors in Morale

Item	Employee Ranking	Employer Ranking
Credit for all work done	1	7
Interesting work	2	3
Fair pay	3	1
Understanding and appreciation	4	5
Counsel on personal problems	5	8
Promotion on merit	6	4
Good physical working conditions	7	6
Job security	8	2

Inspection of this table shows that there is room for misunderstanding between the two groups. Thus employees rate "credit for all work done" and "counsel on personal problems" as more important than employers do, whereas the latter rate salary and security as the two most important items. It is also interesting to note that both groups rate good physical working conditions as relatively unimportant, and yet a great amount of money is spent on such things as air conditioning, light control, oil-absorbing floors, and music, and very little on attitude measurement. More will be said about this later; here it is necessary only to say that employers continually underestimate the importance of attitudes on the assumption either that they know employee attitudes or that the attitudes of their employees are similar to their own.

Not many studies of employer attitudes have been made; work is necessary in this field. Even though the content of this chapter might seem to justify the title "Employee Attitudes," rather than the one used, the title of the chapter was chosen in order to drive home the point that not only can attitudes be measured by these five methods but that these methods can also be used to measure employer attitudes as well. The evidence indicates that, in addition to having attitudes, both groups have attitudes toward each other that differ from their attitudes toward themselves. A clear exposition of this fact by a skillful technician would lead to greater mutual understanding. At the present time industry, as represented by employer and employee, lacks such insight.

One of the rare studies of executive attitudes is Cherington and Bergen's interesting report *(1)* of the attitudes of 51 senior executives in a large company.

Prior to undertaking a study of the attitudes of its employees and supervisors, this company first surveyed the attitudes of its 51 senior executives by means of a questionnaire. The questionnaire was "designed to bring out specific attitudes toward the various points of relationships between superiors and associates, the plan of organization and the effectiveness with which its various units had been co-ordinated, impartiality of executives, compensation, fairness in selecting junior executives for promotion, the effectiveness of executive training, union relations and the like." In addition, the questionnaire was designed to measure the general morale of this group and their "total" attitudes toward their work and the company. The item-checking method of filling out the questionnaire was used, and precautions were taken to insure anonymity.

The results show that the most unfavorable specific attitude held by this group concerned their compensation. Over 50 per cent felt that the salaries for their positions were lower than those for other comparable positions in the company. Another source of dissatisfaction was the promotion procedure, as evidenced by the fact that less than one-third believed that the best man always received the promotion. These executives felt a strong need for a clear-cut organization plan and for more effective coordination of the various executives. Some respondents showed lack of any clear understanding of their own duties, responsibilities, and authority and those of their fellow executives. Only half of them believed that certain specialized departments—such as personnel, industrial engineering, and the laboratory—helped them in discharging their duties. Only half the group felt that they were really part of the management of the company. The group expressed a desire for more intensive executive training and a need for information which they were not getting—on plans, the company's long-range programs, general business conditions, and development of labor relations in the company.

The executives ranked ten selected personnel practices in the following order of relative importance:

1. Fair pay.
2. Clean-cut definition of duties, responsibilities, and authority.
3. Promotion on merit.
4. Credit for work accomplished.

5. Job security.
6. Understanding leadership by superiors.
7. Adequate job instruction and related information.
8. Prompt and fair adjustment of grievances.
9. Fair layoff procedure.
10. Adequate retirement benefits.

Incidentally, the general morale of the group was good. A score of from 0 to 100 was possible. The average was 77, with a range of 55 to 97.

Two important points are revealed in this study. The first shows that there is room for misunderstanding because the employee's attitude and that of the employer differ. For example, an employee is not ordinarily inclined to think of senior executives as being concerned about equality of salary. The average employee believes an executive earns so much money that such problems cannot exist for him. How often does an employee think of a senior executive as feeling a strong need for clear-cut organization and for a definition of duties, responsibility, and authority? How many employees realize that a senior executive may not consider himself part of the management of the company? The second point shows that the employer's impression of the employee's attitude is not well grounded. This study indicates that the executive projects upon the employee his own evaluation of the importance of money. Fair pay ranks first in the list of personnel practices. Similarly in Fosdick's study, the employers rank fair pay first. Yet Fosdick's study and other studies of employee attitude show that employees do not rank this first. The attitude toward money will be considered more fully in the next three chapters, on job satisfaction, industrial morale, and incentives. Here it is presented merely as food for thought.

SUMMARY

Five methods of measuring attitudes in industry were described: the impressionistic, guided interview, unguided interview, questionnaire, and the attitude scale. In addition to discussing the advantages and disadvantages, an illustration of each method was presented.

The main concern of this chapter was with how attitudes can be measured in industry. The secondary concern was the fact that knowledge of employee and employer attitudes must be obtained if a greater insight and a better relationship between the two groups is to exist. Specific findings, although presented, were not considered very important. The specific factors that contribute to job satisfaction and industrial morale are discussed in the following chapters.

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4. Job Satisfaction

JOB satisfaction is the result of various attitudes possessed by an employee. In a narrow sense, these attitudes are related to the job and are concerned with such specific factors as wages, supervision, steadiness of employment, conditions of work, advancement opportunities, recognition of ability, fair evaluation of work, social relations on the job, prompt settlement of grievances, fair treatment by employer, and other similar items.

However, a more comprehensive approach requires that many additional factors be included before a complete understanding of job satisfaction can be obtained. Such factors as the employee's age, health, temperament, desires, and level of aspiration should be considered. Further, his family relationships, his social status, his recreational outlets, his activity in organizations—labor, political, or purely social—contribute ultimately to job satisfaction.

In short, job satisfaction is a general attitude which is the result of many specific attitudes in three areas, namely, specific job factors, individual adjustment, and group relationships outside the job.

CONFUSION OF TERMINOLOGY

THE methods employed in measuring attitudes were presented in the preceding chapter. We emphasized there that the studies reported illustrated the various methods and that the findings were of secondary importance. The main reason for this is the great confusion in the use of the term job satisfaction and in the factors that contribute to it. Reviewing the many studies in the area almost leads one to the conclusion that job satisfaction is anything that an author measures when he thinks that he is measuring "job satisfaction." Too few experimenters in this field have been concerned with either the reliability or the validity of their measures.

Some studies have dealt only with attitudes on some specific job factors but have been called job satisfaction studies. Others have investigated other job factors, and have also been called job satisfaction research. Still others have considered the individual factors and the job factors, and a few have attempted to measure parts of all three areas. It is no wonder that conflicting results are found in the literature on this subject. No one study is necessarily more in error than another one, but most are incomplete. For example, an organization that has a good personnel program and offers steady work, good supervision, etc., may nevertheless find that a particular worker has little job satisfaction because of his capabilities in connection with his particular job, family problems, or unhappiness about his failure in union activities.

It is extremely difficult to rank the various factors involved in job satisfaction. They vary in importance not only from individual to individual but also in the same individual from time to time. For instance, an employee may be dissatisfied with his salary. When he gets a raise he may still be dissatisfied, but this time because he feels that the boss should have given it to him weeks ago.

One additional point must be made about the confusion among the terms "employee attitude," "job satisfaction," and "industrial morale." Although in many instances they are used interchangeably, they are not synonymous. An "attitude" is not "job satisfaction." However, it may contribute to job satisfaction since the latter is comprised of a number of attitudes. Similarly job satisfaction is not the same as industrial morale, although it may contribute to morale. An illustration of the confusion in the use of these terms is afforded by an article by Dr. Arthur Kornhauser (*10*), a careful and brilliant scholar in the field of industrial psychology. In the table of contents of that issue of the *Journal of Consulting Psychology* this article is listed as "Psychological Studies of Employee Morale." However, the article itself bears the title "Psychological Studies of Employee Attitudes." In it the author makes cogent remarks concerning the errors and difficulties in the field, and yet he refers to job satisfaction and industrial morale as if they were identical and interchangeable concepts.

An attitude of an employee can be considered as a readiness to act in one way rather than another in connection with specific factors related to a job.

Job satisfaction is the result of various attitudes the employee holds toward his job, toward related factors, and toward life in general. Industrial morale is a by-product of a group and is generated by the group. It has four determinants: feeling of group solidarity; need for a goal; observable progress toward the goal; and individual participation in meaningful tasks necessary to achieving the goal. Industrial morale may be defined as the possession of a feeling, on the part of the employee, of being accepted by and belonging to a group of employees through adherence to common goals and confidence in the desirability of these goals.

Authors and experimenters have measured employees' reactions and have labeled them sometimes job satisfaction, sometimes morale, and at other times merely attitudes. There were similar practices years ago in the field of psychological testing. Thus an author of a test named it on the basis of what he believed it was measuring; "Technical Information" and "Teaching Aptitude" are examples. At the present time no one would dare propose a psychological test—and hope to keep his professional reputation—without establishing the validity of the test to prove that it measured what it was supposed to. In order that job satisfaction may be better understood, a clear-cut and decisive study of employees with high and low degrees of this is needed. Such a study might define the criteria as a combination of an employee's estimate of his own satisfaction, the boss's estimate of the employee's satisfaction, and other sources of information. These, in turn, could be compared with the various factors that contribute to job satisfaction. Only in this way can complete insight into it be achieved.

Why seek information about job satisfaction? For an industrial organization, the consequences are extremely important. By discovering attitudes on factors related to the job, a firm can correct certain bad situations and thereby improve the job satisfaction of its staff. From this point of view it would be justified in being concerned only with this area and neglecting the individual "ego" and its employees' adjustment to groups outside the plant. However, an industrial organization can benefit materially if it knows what individual attitudes contribute to job satisfaction. For one thing, applying this knowledge would result in better selection procedures. This is a broad implication as far as job satisfaction is concerned; and even though most industrial and business organizations feel that it is not their problem, it nevertheless exists. It is also directly related to vocational guidance, schools and colleges, public and private employment agencies, etc.; and society as a whole must face it realistically.

FACTORS MEASURED IN JOB SATISFACTION

BECAUSE of the ramifications of the problems connected with job satisfaction, surveys and studies have been carried out on a community-wide basis, in specific professional or occupational groups, and, of course, in specific industrial establishments.

One of the best of community-wide surveys, as well as a thorough review of the work in this field up to the time of publication, is presented in Dr. Robert Hoppock's *Job Satisfaction* (7). After reviewing thirty-two investigations conducted prior to his survey, he summarizes the results with the statement, "Two-thirds of the studies showed less than one-third of the workers to be dissatisfied." He notes that in none of these studies was an attempt made to obtain a sample that was representative of workers in all occupations and age groups. Hoppock also asked thirty-six nationally prominent personnel officers to estimate the percentage of workers who were dissatisfied. The answers ranged from zero to 80 per cent, the average being 49 per cent. But, as he says, if numbers from 0 to 100 were put in a hat, the average of the numbers drawn would be 50. Hence it may well be that the 49 per cent is as void of meaning as chance itself.

Hoppock conducted his own survey during the summer of 1933 in New Hope, Pennsylvania. Of the 351 employed adults in the town, 309, or 88 per cent, answered the questionnaire. The percentages for each of the questions are shown in Table 7.

TABLE 7. Responses on Hoppock's Questionnaire

1. Choose the ONE of the following statements which best tells how well you like your job. Please place a check mark in front of that statement:

Response	Frequency	Percentage
I hate it	5	2
I dislike it	6	2
I don't like it	34	11
I am indifferent to it	29	9
I like it	194	63
I am enthusiastic about it	27	9
I love it	14	5
Total	309	101

2. Check one of the following to show HOW MUCH OF THE TIME you feel satisfied with your job:

Response	Frequency	Percentage
All of the time	128	41
Most of the time	83	27
A good deal of the time	24	8
About half of the time	29	9
Occasionally	16	5
Seldom	14	5
Never	15	5
Total	309	100

3. Check the ONE of the following which best tells how you feel about changing your job:

Response	Frequency	Percentage
I would quit this job at once if I could get anything else to do	39	13
I would take almost any other job in which I could earn as much as I am earning now	13	4
I would like to change both my job and my occupation	20	7
I would like to exchange my present job for another job in the same line of work	12	4
I am not eager to change my job, but I would do so if I could get a better job	130	43
I cannot think of any jobs for which I would exchange mine	54	18
I would not exchange my job for any other	37	12
Total	305	101

4. If you could have your choice of all the jobs in the world, which would you choose? (Check one):

Response	Frequency	Percentage
Your present job	145	48
Another job in the same occupation	48	16
A job in another occupation	107	36
Total	300	100

5. Check one of the following to show how you think you compare with other people:

Response	Frequency	Percentage
No one likes his job better than I like mine	59	19
I like my job much better than most people like theirs	50	16
I like my job better than most people like theirs	35	11
I like my job about as well as most people like theirs	114	37
I dislike my job more than most people dislike theirs	25	8
I dislike my job much more than most people dislike theirs	5	2
No one dislikes his job more than I dislike mine	18	6
Total	306	99

6. Which gives you more satisfaction? (Check one):

Response	Frequency	Percentage
Your job	200	66
The things you do in your spare time	102	34
Total	302	100

7. Have you ever thought seriously about changing your present job?

Response	Frequency	Percentage
Yes	122	39
No	159	51
Omitted	28	9
Total	309	99

8. Have you ever declined an opportunity to change your present job?

Response	Frequency	Percentage
Yes	81	26
No	196	63
Omitted	32	10
Total	309	99

9. Are your feelings today a true sample of the way you usually feel about your job?

Response	Frequency	Percentage
Yes	267	86
No	19	6
Omitted	23	7
Total	309	99

An index of job satisfaction was computed, the results being shown in Fig. 5. A breakdown according to occupational classification indicates that the average index is lowest for the unskilled category and highest for the professional category; this is shown in Table 8.

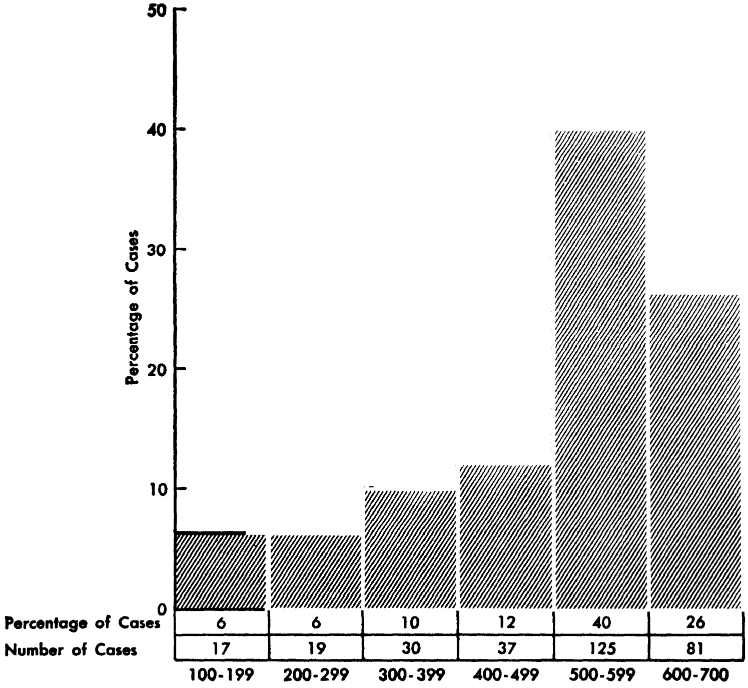

FIG. 5. Distribution of Job Satisfaction Indexes, 309 Employed Adults. An index of 100 indicates extreme dissatisfaction; 700 indicates extreme satisfaction; 400 indicates indifference. (From Robert Hoppock, *Job Satisfaction*, Harper & Brothers.)

This survey indicated that there was considerably more job satisfaction than dissatisfaction when all the persons who are gainfully employed are included in the survey.

Hoppock also conducted a survey on people in one occupation, namely, teachers. Five hundred teachers from 51 urban and rural communities in the northeastern

TABLE 8. Job Satisfaction Indexes of 5 Occupational Groups, New Hope, Pennsylvania, 1933

Occupational Classification	Number of Cases	Range of Indexes	Mean Index
1. Unskilled manual	55	100–650	401
2. Semi-skilled	74	125–650	483
3. Skilled manual and white-collar	84	125–675	510
4. Subprofessional, business, and minor supervisory	32	250–700	548
5. Professional, managerial, and executive	23	300–700	560

United States estimated their job satisfaction on four attitude scales. By combining these scales, a measure of job satisfaction was obtained. Of this group the 100 most and 100 least satisfied were asked about 200 questions. A comparison of their answers differentiated the satisfied from the dissatisfied teachers in the following areas:

1. The satisfied showed fewer indications of emotional maladjustment.
2. The satisfied were more religious.
3. The satisfied enjoyed better human relationships with superiors and associates.
4. The satisfied were teaching in cities of over 10,000 population.
5. The satisfied felt more successful.
6. Family influence and social status were more favorable among the satisfied.
7. The satisfied "selected" their vocations.
8. Monotony and fatigue were reported more frequently by the dissatisfied.
9. The satisfied were 7.5 years older.

One interesting finding is that the difference in average salaries between the two groups was not statistically significant.

One brief comment is necessary about this survey. No attempt was made to measure the proficiency of the

TABLE 9. Number of Persons, Among 40 Employed Adults, Who Mentioned Various Factors in Stating Reasons for Liking Their Jobs, August-September, 1932

Factor	No. of Persons
Associates, including customers, pupils, etc.	28
All or part of the work itself, e.g., dentist likes to fill teeth, merchant likes to buy and sell, engineer likes to run locomotive	24
Boss	11
Variety	9
Freedom in work	8
Hours	6
Visible results	6
Earnings	5
Advancement	4
Satisfaction of doing good work	4
Service	4
Outdoors	4
Surroundings	3
Interesting work	3
Responsibility	2
Social status	2
Being in charge	2
Easy	2
Can live in country	2
Vacations	2
Self-expression	2
Outlet for training	1
Good company to work for	1
Excitement	1
Challenge of quota	1
Can live in home town	1
Competition	1
Opportunity to study	1
Work appreciated by others	1
"Religion in it"	1
No time clock	1
Chance to work where he pleases	1

teachers and therefore it is not known whether those who were dissatisfied were less "good" than the satisfied group. This survey also brings out the point that job satisfaction and vocational interest are not identical. For example, 84 per cent of the dissatisfied teachers answered "yes" to the question, "Is your work interesting?"

As a pilot study one year prior to the New Hope study, interviews were held with 40 employed adults, at which they were asked to check statements they agreed with. The findings are summarized in Tables 9, 10, and 11. Table 9 shows that of the factors making for liking a job, associates, the work itself, and the boss are most frequently mentioned.

Table 10 lists the factors for disliking a job. Here the major factor is the work itself, with associates, earnings, and the boss in a secondary role.

TABLE 10. Number of Persons, Among 40 Employed Adults, Who Mentioned Various Factors in Stating Reasons for Disliking Their Jobs, August-September, 1932

Factor	No. of Persons
All or part of the work itself	20
Associates	9
Earnings	8
Boss	7
Hours	5
Little or no advancement	5
Traveling	3
Work hurts conscience	3
Politics	2
Indoors	2
Details	1
No travel	1
Standing up	1
"Earn every dollar yourself"	1
Fatigue	1
Demotion	1
Dirty	1
Community	1
Public criticism	1
Inadequate equipment	1
Insecurity	1

Whereas there are 144 mentions in Table 9, there are only 75 in Table 10. The favorable items comprise about 65 per cent of the total number and are mentioned about twice as often as the unfavorable items. This finding is rather similar to that in Uhrbroch's survey mentioned previously on page 70.

A check list of 56 items, containing approximately as many favorable as unfavorable statements, was presented to this group of 40 employed adults. The favorable statements were most often checked and again associates and work occur most frequently. The complete check list is shown in Table 11.

TABLE 11 Number of Persons, Among 40 Employed Adults, Who Endorsed Various Statements on "A Check List of Opinions," August September, 1932

Statement	No of Persons
I like the people with whom I work	34
I like my work	31
I am enthusiastic about my work	30
The place where I work is comfortable and pleasant	29
My working hours are satisfactory	27
My work gives me a fine opportunity to help others, which I enjoy .	25
I like my boss .	24
My boss is fair	22
My work offers a fair opportunity for me to advance	22
My work is difficult but interesting	20
This business is holding its own and may grow I am satisfied with its prospects for the future	18
I am in a growing business which offers me fine prospects for the future	17
My work is good for my health	17
I am enthusiastic about the opportunities which I have to advance in my vocation	17
My job is steady enough to suit me ..	17
I have the finest boss I could desire	16
My work is not dangerous and I am glad it is not	15
I am well prepared for the work I am doing	15
My work is not difficult	13
My preparation for this work is excellent	12
My working hours are perfect	12
I am very well paid for the work that I am doing	12
I would not exchange my work for any other	10
The people with whom I work are the nicest people I know	10
I am satisfied with my present earnings	9
I am worth more than I am paid	9
My working hours prevent me from enjoying many things I would like	9
Others who are better prepared for this work have an advantage over me	8

TABLE 11 (*Continued*)

Statement	No. of Persons
My job is secure; I will never have to worry about being unemployed	7
My work is easy	7
There is no chance to advance in this work	4
I feel that God called me to do this work	4
My boss is unfair	3
My employment is not as steady as I would like it to be	2
This business is becoming less important	2
I dislike my work	1
My work is useless; it contributes nothing of value to the world	1
The place where I work is too cold or too hot, too dirty, or too unpleasant in other ways	1
My work is too easy	1
My work puts me in danger of injury or disease; I do not like this	1
I am afraid of my boss	1
I am afraid I will be laid off or discharged	1
I do not like the people with whom I work	1
I will never get anywhere in this occupation for others are holding me back	0
My working hours are ruining my life	0
I hate my boss	0
I hate the people with whom I work	0
I loathe my work	0
I will never succeed in this occupation because I do not have the necessary preparation	0
My work is too dangerous; I am afraid of being injured	0
I am wasting my talents in my present occupation	0
This business will soon be unknown and I will have to find a new occupation	0
My work is so difficult that I cannot do it	0
I detest my work	0
My work is injuring others; I wish I could find something else to do	0
My employers are cheating me out of the money I really deserve	0

In the epilogue to his study on job satisfaction, Hoppock proposes the following six major components of job satisfaction:

1. The way the individual reacts to unpleasant situations.

2. The facility with which he adjusts himself to other persons.
3. His relative status in the social and economic group with which he identifies himself.
4. The nature of the work in relation to the abilities, interests, and preparation of the worker.
5. Security.
6. Loyalty.

These six items are not of the minute and specific character that are measured in many studies on job satisfaction. Possibly that is what is wrong with many of these studies. Hoppock's approach is to be commended for this reason; he is aware of the real factors which contribute to job satisfaction and does not get lost in the petty details. Job satisfaction is an important generalized attitude in an individual, not a specific attitude about specific job factors. The idea that it is related to the individual's emotional adjustment suggests that those who are unstable emotionally may have considerably more difficulty adjusting themselves to a job, and may therefore be dissatisfied with it.

Anyone who has ever held a job knows that if he does not get along with his co-workers the job is unsatisfactory. The most rugged, aggressive, and independent individual will not be satisfied at work if he cannot get along with the working group. Furthermore, adjustment to people on the outside affects a person's adjustment to his job. A secretary who is not getting along with her boy friend or a husband who has had an argument with his wife is likely suddenly to find some dissatisfaction with the job which did not exist before; this usually disappears just as suddenly, after the "kiss and make-up" stage.

In our culture, as in many others, there is a strong desire to be approved and respected by others, especially one's friends. If an individual is to have job satisfaction, he must feel that he is on a par with his friends. College graduates consciously or unconsciously sacrifice money when they enter the professional rather than the business field. They are reluctant to choose selling as an occupation because they feel they are "too good" for it. The fact that they eventually sell professional services does not bother them, whereas selling insurance or hats usually does. The factory worker whose friends also work in a factory can feel he is as good as they are; he will have greater job satisfaction than the factory worker whose friends are mainly office workers.

Job dissatisfaction may well be the result of a lack of vocational guidance. A person who is "too good" or "not good enough" for a job, in terms of his abilities and interests, is not likely to be satisfied with his job. During the depression years college graduates were available at a "dime a dozen." Department stores discovered this and proceeded to hire them at almost this rate. But they soon had to discontinue this policy, because the young men and women were "too good" for the job and left in droves, despite the fact that there were few positions open. People are not capable of working for any length of time at a job which they feel is below them. This is true also of people who do not possess the necessary abilities. A college professor who cannot keep up with his students is likely to be a "sad sack." He may come to the conclusion that his students ask questions only to prove how smart they are. Certain police departments face the peculiar problem of having officers who are less capable than the patrolmen. Friction results. This applies not only to colleges and police departments but to all types of business organizations.

Security contributes to job satisfaction, but we must remember that security is both social and economic, not solely economic. More important, security is relative, not absolute. Resignations are handed in in the civil service even though the positions carry tenure; furthermore, some people holding these jobs report greater insecurity than some industrial employees who have no guarantee of continued employment. Of course, it may be that insecure people seek civil service jobs and that their basic insecurities prevent their feeling any great job security. Adventurous and dangerous jobs are sometimes considered "secure" even when life itself may be in the balance. A physican is secure in his position and cannot be prevented from continuing in it (barring a few legal exceptions), but he has no guarantee that people will call him. The point is that security is a relative, not an absolute concept.

Loyalty is not to be overlooked in job satisfaction. This feeling that the worker has for his firm or boss, or both, contributes to job satisfaction. Although it is not likely to be as strong as the "school spirit" evidenced by loyal sons of Alma Mater, it is present in employees. It is the factor that leads people to sacrifice their own needs and purposes. It is the factor that prompts service beyond the line of duty in relation to job requirements.

Better to understand job satisfaction we must take into consideration the opportunities for satisfaction that the job itself affords the individual as well as the broader opportunities it offers him. The job satisfaction index rises with occupational level. Kornhauser (*9*) reports findings which have a bearing on this point. He asked four different economic groups seven questions dealing with personal satisfaction and in each instance found that the higher-income groups indicated greater personal satisfaction. The questions and answers in percentages are presented in Table 12, modified from his.

Each of these questions is directly or indirectly related to job satisfaction. Questions 2 and 4 are the only ones to which the majority of the lowest-income group gave favorable answers and yet they are of the essence of job satisfaction. This study is cited to show that if the economic range is great enough, salary may become a significant factor, but that with any one occupational group (i.e.,

TABLE 12. Comparison of Groups in Personal Satisfaction Questions

	Over $5000	$2000 to $5000	$1000 to $2000	Under $1000
1. Do you feel that your children have as much opportunity as they should have?	83	60	46	39
2. Do you like the kind of work you do?	95	91	81	67
3. Do you feel that your pay is fair?	90	69	53	34
4. Would you say that you are treated well by the people you work for?	96	90	86	77
5. Do you feel that there is any danger of losing your job?	89	80	72	49
6. Do you feel that you have as much opportunity to enjoy life as you should have?	82	69	55	36
7. Do you feel that you have a good chance to get ahead in life and become fairly well off?	96	78	69	43

Hoppock's teachers) or within a limited range it is a minor factor.

Goodwin Watson (*16*) has conducted a few studies in job satisfaction, the results of which are summarized here to shed additional light on the role of salary as a factor in job satisfaction. He states, "Without in any way denying the need of many workers for higher wages, it may be recognized that sometimes workers, vaguely dissatisfied with the way things are going, know no other way of meeting the situation. They ask for more pay or shorter hours, and perhaps they should have these, but if these demands were attained, the relief would be only temporary. The underlying cause of dissatisfaction may be not in the pay envelope or the time clock, but in the work itself."

In this study, and in a similar study by Seidman and Watson (*13*), a sampling of men and women were asked to report on the job previously held which was most satisfactory to them and to give the reasons for their selection. The results, which are shown in Table 13, present further evidence that recognition, friendly associations, work fitted

TABLE 13. Reasons Why Workers Preferred One Job Rather Than Another (in Percentages)

Reason	Watson Study		Seidman-Watson Study
	Men	Women	Young Men
Congenial work conditions and social contacts	21	38	24
Responsibility, initiative, prestige	27	23	19
In line with vocational aspirations	15	13	29
Variety	15	12	12
Salary	13	6	4
Shorter hours	3	6	4

to vocational level, and variety of duties are more important contributing factors in job satisfaction than salary.

This same problem was approached from a slightly different angle by Watson and Seidman (*16*) and Seidman (*12*). In these studies, unemployed adults were asked, "If you feel that you weren't entirely successful on some of the jobs you have held, to what do you attribute that fact?" The answers, given in percentages in Table 14, show again that the nature of the work, congeniality of working conditions, and social contacts are more conducive to work sat-

TABLE 14. Reasons Given for Work Dissatisfaction (in Percentages)

Reasons	Seidman Study		Watson-Seidman Study
	Men	Women	
Deficiencies within self (personality)	32	41	24
Nature of work; monotony	35	20	47
Uncongenial work conditions	11	9	9
Lack of education and experience	7	20	9
No promotion opportunity	5	1	9
Ill health	4	5	0
Social and economic conditions	4	3	0
Low wages	1	1	1
Long hours	1	0	1

isfaction than wages and working hours. These four studies of Watson and Seidman corroborate other findings, and lead to the conclusion that wages are not the most important factor in job satisfaction.

A review of the material presented thus far in this chapter, and of that in the preceding chapter, should make it clear that job satisfaction can be measured in one of two ways. One method is to investigate the specific factors on the job and the resulting attitudes. The other, which is much more comprehensive, includes the over-all factors that contribute to satisfaction in life. Neither method is necessarily right or wrong. However, progress can be made in this important field only after there is an understanding of the many factors which are involved and when research findings are reported in such a way as to allow meaningful comparison. For example, one who wanted to measure intelligence could not do so by making up six or eight or even eighty questions and assuming that they would measure intelligence, because the present development of intelligence testing would make such a process completely foolish. But pretty much the same thing is being done in measuring job satisfaction at the present time, and we are congratulating ourselves on our own good judgment in the firm belief that the other fellow does not really know what it is all about.

MEASURING JOB SATISFACTION

EITHER of two approaches will lead to uniformity of conclusion in regard to measuring job satisfaction. A business organization may use either one, depending on its problem. If it believes that it is limited in the things it can do about job satisfaction, it can limit its investigation accordingly. In this case there is little reason for it to make a deep motivation analysis of its employees. If, on the other hand, it is concerned with broader aspects of job satisfaction, the survey must include information related to vocational guidance and selection.

Scale Method. In solving the problem as it affects the first part of the definition of job satisfaction, a good starting point is the work of Walter A. Woods *(18)*. Although there is ample room for disagreement as to whether the scale that he proposes measures morale, it does appear that the seventeen areas he suggests are concerned with specific factors in job satisfaction. The statements in each area, together with their scale values, are presented in Table 15. The scale values were determined by the ratings of the 68 men who supervised the workers. These values are not to be accepted as necessarily correct because, as has been pointed out, a supervisor's attitude about an employee attitude is not the same thing as the employee's attitude. Another technical difficulty arises from the fact that this scale is too heavily weighted in the extreme value statements and does not present a sufficient number of neutral opinions. Many of the statements have rather similar scale values; hence those that overlap have been omitted. A further modification is relatively minor and involves the title which has been given to each of the areas.

TABLE 15. Modified Woods' Scale to Measure Job Satisfaction

You are asked to check the one statement in each of the following groups which most closely represents your opinion.

	I. *Job Instructions*	Scale Value
1.	If instructions conflict the employee should seek the advice of his immediate supervisor at once.	8.3
2.	Our supervisors always appreciate the employee's point of view regarding instructions.	7.9
3.	I feel that I receive too many instructions that are meaningless.	2.7
4.	There is no use following all instructions too carefully for some supervisors do not understand the details of the job.	2.3
5.	Instructions are often unimportant and should not be taken too seriously.	1.3
6.	Instructions don't mean a thing for the supervisors do not know the job.	0.3

TABLE 15 (*Continued*)

		Scale Value
	II. *Assuming Responsibility*	
1.	It is always a pleasure to assume responsibilities here.	8.9
2.	It will benefit an employee to assume responsibilities whenever possible.	8.4
3.	It is to the employee's best interest always to assume responsibilities when necessary.	7.7
4.	The supervisors rather than the employee get paid for taking on responsibilities.	3.2
5.	The officials do not expect employees to assume responsibilities so they shouldn't assume any unnecessary risks.	2.6
6.	It is always best to let others assume responsibilities for nothing is gained by taking unnecessary risks.	1.3
	III. *Suggestions*	
1.	Employees here are always anxious to make constructive suggestions about their work.	8.4
2.	There are times when constructive suggestions are appreciated.	7.4
3.	Constructive suggestions would not be appreciated here.	2.1
4.	It is not worth while to offer suggestions on how to improve the work.	1.3
	IV. *Supervision*	
1.	Our supervisors are capable men.	8.7
2.	The officers have earned their positions by being good administrators.	8.5
3.	Most of the officers are good men but there are a few who aren't.	6.9
4.	There are a few good fellows among the officers.	4.7
5.	If the supervisors were more capable they wouldn't be criticized so much.	2.1
6.	The officers would be better liked if they didn't act like they were so much better than anyone else.	1.0
7.	The officers would be better liked if they weren't such a bunch of capitalists.	0.7
	V. *Knowledge of Management Plans*	
1.	It will help the organization if the employees try to keep acquainted with the plans of the management.	8.0
2.	It is to the employee's interest to keep acquainted with the plans of the management.	7.1
3.	It makes very little difference whether the employee shows interest in the plans of the management.	2.3
4.	I can't be bothered with so-called plans of the management.	0.8
	VI. *Work Meaning*	
1.	The work we are doing is really a great service to mankind.	8.8
2.	The public should be encouraged to support the work we are doing.	7.4
3.	Our work is not so important but somebody has to do it.	2.7
4.	The work we are doing is one of those necessary evils.	1.8
5.	Our work is really a racket.	0.6

Table 15 (*Continued*)

		Scale Value
	VII. *Employee Co-Relations* (*A*)	
1.	It is a pleasure to do favors for fellow workers here.	8.7
2.	An employee should, if necessary, go out of his way to help fellow employees.	7.6
3.	Employees should do favors for each other.	7.3
4.	It is all right to do favors for fellow employees if they have done one for you.	4.9
5.	It is all right to do a favor for a fellow employee now and then.	4.3
6.	If you start doing favors for fellow employees you will soon be imposed upon.	1.3
7.	Nothing is gained by doing a fellow employee a favor. .	0.6
	VIII. *Employee Co-Relations* (*B*)	
1.	It is a pleasure to be courteous to the kind of employees we have here.	9.0
2.	It is wise to treat fellow employees courteously.	8.0
3.	It is generally a good practice to be courteous to fellow workers.	7.3
4.	It doesn't do any harm to speak to fellow employees but it isn't necessary.	2.6
5.	There is no need to be particularly courteous to fellow employees.	2.3
6.	It is best to avoid speaking to fellow employees as much as possible.	1.2
7.	It helps bring fellow workers around to snub them now and then.	0.6
8.	Fellow employees here deserve to be snubbed.	0.3
	IX. *Employee-Public Relations*	
1.	We are all proud of our organization and its work and are anxious to have the public think well of us.	9.1
2.	Employees should be courteous to the public whenever possible.	8.1
3.	It really saves time and trouble to explain things fully to everyone who has dealings with the organization.	7.8
4.	In dealing with the public you just have to make it snappy or you will never get your work done.	4.1
5.	Some of the folks who come into this office are pests and you can't waste too much time on them.	2.5
	X. *Job Attitude*	
1.	I wouldn't change jobs with anyone.	9.1
2.	I like the work here because it is so interesting.	8.9
3.	There is no reason to object to a job in this organization.	7.6
4.	I would like my job better if there were any future in it.	4.4
5.	An employee here cannot be blamed for looking for a better job elsewhere.	3.0
6.	This work is so trying I am really glad when it is time to quit.	1.2
7.	The work is so monotonous I'm glad to forget about it after quitting time.	0.7
8.	I really hate this job but what can one do about it?	0.5

TABLE 15 (*Continued*)

	Scale Value
XI. *In-Service Training*	
1. The management offers the employee unlimited opportunity for training to improve his work and service.	8.9
2. The management makes it worth while for an employee to improve his training.	8.0
3. Political pull rather than training makes for advancement here.	1.5
4. There is little use in bothering with outside training for the management has most of us pegged where it wants us.	1.1
XII. *Career Opportunity*	
1. This organization offers ideal opportunities for a career.	8.9
2. This work has many features which makes it worth while as a career.	7.7
3. If one were interested in a career he would not stay here too long.	2.4
4. As a career this job has absolutely nothing to offer.	1.3
5. The career boys here are the ones with a drag.	1.0
6. There is no use in my thinking of a career; things are set against me.	0.1
XIII. *Compensation*	
1. Employees here are well paid in proportion to their ability.	8.3
2. The best way to get a raise is to tend to business.	7.8
3. The most able employees are not always the best paid.	4.2
4. You never get a raise here until you ask for it.	3.3
XIV. *Work Environment*	
1. Our working conditions here are ideal.	9.4
2. Working conditions here aren't so bad.	6.6
3. There are many things that can be done to improve our working conditions.	4.8
4. How can the management expect us to get anything done under the conditions in which we are presently working?	2.5
5. Working conditions here couldn't be much worse.	0.6
XV. *Work Recognition*	
1. The employees here appreciate the credit that is gladly given by the management for good work.	8.9
2. The management is fairly good about recognition of work done well.	7.1
3. Sometimes credit is given for good work here and sometimes not.	4.3
4. You may as well take advantage of the other fellow's good ideas to get credit for yourself, that's what everyone else does.	1.0

TABLE 15 (*Continued*)

	Scale Value
XVI. *Promotion*	
1. The chances for promotion are ideal here.	9.1
2. Employees are always given plenty of opportunity for promotion.	8.5
3. The best-qualified people always get the promotions here.	7.7
4. If a fellow isn't fitted for the job he should refuse a promotion.	6.1
5. More employees would stick with the organization if the chances for promotion were better.	4.4
6. The best-qualified people do not always get the promotion.	4.1
7. There are a few opportunities for promotion, but generally they aren't so good.	3.2
8. It doesn't pay to work hard for promotion here for there aren't any opportunities anyway.	2.3
9. It seems to make little difference whether an employee works hard to earn a promotion.	1.9
10. Promotions are a matter of luck and political pull.	0.9
XVII. *Outside Factors*	
1. The management has been very considerate on occasions when I was having problems and worries outside the line of duty.	8.5
2. An employee should always try to keep outside influence from affecting his work.	8.3
3. There is nothing the matter with the job here, I am just worried by some conditions outside the line of work.	5.3
4. I haven't been able to do my best because so many other matters were troubling me.	3.9

The primary reason for including the modified Woods' Scale is to suggest that these 98 statements might be incorporated into a job satisfaction scale and that eventually a standard measure might be derived from them. They could be included as one group instead of being separated into subgroups, and they should be presented without scale values and in random order. A group of employees could be given the scale; an analysis of the results would inform management as to how it stood in each of the specific areas, and also give a composite picture of the individual employee's satisfaction with his job.

Predicting Job Satisfaction. The second method proposed for measuring job satisfaction includes the individual and his adjustment and is used in the personnel department at the time of hiring. This method assumes that a person is predisposed to job satisfaction or dissatisfaction prior to being employed, and hence strikes at the core of the problem. It demands that all applicants be screened, a process which provides measures of the individual's intelligence, abilities, interests, and personality, at least to the extent of emotional stability.

Adjustment on the job, according to this method, is dependent upon the individual's abilities, interests, and personality. When the specific job factors are related to his make-up, job satisfaction is possible. But when they clash, there is job dissatisfaction, and the extent of the clash determines the depth of the dissatisfaction. After all, few people are likely to understand the problem in relation to their own limitations; it is much easier to avoid undermining the self and instead ascribe the trouble to some outside factor such as the job.

The numerous studies on the relation of intelligence test scores and job performance that have been made suggest that for a particular occupation a score within a certain range is likely to be best. That is, a person may have either too much or too little intelligence to do a job successfully. Obviously it is poor employment procedure always to hire the individual with the highest intelligence, regardless of the job; this usually results in considerable harm to both the individual and the job. As long ago as 1918, the Army Alpha testing program established that scores on intelligence tests varied according to previous occupation; Table 16 presents a portion of the findings reported by Douglas Fryer (5). Although each of the selected occupations has a considerable range and there is overlapping from occupation to occupation, the hierarchy is plainly established.

Considerable differences are to be found within the same occupation. For example, Miner (*11*) reports that salesmen for a technical product averaged 27 more points on an intelligence test than insurance salesmen. In turn, insurance salesmen averaged 23 more points than wholesale salesmen, but the latter scored on the average 33 more points than retail salespeople. According to Snow (*14*), duller individuals showed least dissatisfaction in highly repetitive work; but when the work was fairly complex, considerable dissatisfaction was manifest. Further reference to this topic will be made in Chapter 10; the point to be stressed here is that an employee's intelligence is a factor in predetermining his job satisfaction. Too much intelligence—that is, more than the job requires—may well lead to dissatisfaction. Similarly, too little will make the job prove too much of a challenge and this may also lead to dissatisfaction.

TABLE 16. Occupational Intelligence Standards

Occupation	Average Score	Range of Scores of Middle Fifty Per Cent of Population (25 percentile to 75 percentile)
Engineer	161	110–183
Accountant	137	103–155
Chemist	119	94–139
Dentist	110	80–128
Clerk (office)	96	74–121
Conductor (railroad)	83	64–106
Electrician	81	57–109
Druggist	78	61–106
Toolmaker	67	50–92
Carpenter	60	40–84
Barber	55	34–78
Teamster	50	30–72
Mason	40	19–60
Shoemaker	35	19–57
Leather worker	30	16–41
Textile worker	26	18–60
Fisherman	20	15–51

This brief discussion of intelligence tests and job satisfaction should not lead to the assumption that there is necessarily a high correlation between such tests and job achievement. Nothing is further from the truth. The subject is introduced solely to suggest that maximum and minimum scores often furnish a lead regarding job satisfaction.

There are other abilities and aptitudes which can furnish similar clues. The previous job history is highly informative and should not be overlooked. Most employees who stay on a job from six months to one year can be assumed to be capable of doing the job. A person who does not have the required ability will find the job frustrating and leave it. When a job history is not available, as is often the case with young applicants, a battery of psychological tests to measure clerical ability, mechanical ability, and abilities in many other fields is often helpful. Tiffin and Greenly (*15*) report a correlation of +.63 between scores on a hand precision test and foremen's ratings of a group of electrical fixture assemblers. Blum (*1*) finds a correlation of +.39 between a combined finger and tweezer dexterity score and earnings in a group of watch factory workers. Cook (2) found that only 8 per cent of the average group failed a coil winding test, whereas 72 per cent in the below-average group failed it. Crissey (*3*) points out that among test-selected employees the turnover for personal reasons is 5 per cent, as against a turnover of 12 per cent for non-test-selected employees. He says further that those who score in the high third on a battery of tests maintain high production and contribute greatly to the improvement of employee morale on the job.

In addition to intelligence and other abilities, interest in the work contributes to job satisfaction. When a person's interests are in line with the job, he can be expected to be absorbed in the job. On gross analysis, interest can be divided into two categories: interest in people and interest in things. Individuals in the first group find the greatest outlet for their interests in jobs that essentially involve people—salesmen, lawyers, teachers, etc. People in the second group, on all levels from factory worker to the professional electrical engineer, find their maximum outlet in jobs which require designing or producing articles, tools, etc. More minute measurements of specific interests in relation to varieties of jobs are afforded by such test inventories as those constructed by Strong, Brainard, and Kuder.

A somewhat difficult question is the relation between interest and ability. In some respects, this is not unlike the famous "chicken and egg" problem, for it is most likely true that in some cases the interest comes first but in other cases it grows out of an aptitude. Nevertheless, it is generally agreed that although the two are different, they tend to go together; the correlation between them is usually found to be +.50.

Last but not least of the contributors to job satisfaction is personality. One of the dimensions of personality is emotional stability—or "neurotic tendency," as it is sometimes called. An individual's emotional stability is likely to manifest itself in satisfaction or dissatisfaction with the job. According to Fisher and Hanna (*4*), "a large part of vocational maladjustment and industrial unrest are secondary to, and but a reflection of, emotional adjustment."

It is very likely that when everything is going smoothly, the emotionally stable and the unstable show little difference on the job. However, when the pressure is on and difficult situations develop, petty annoyances take on major significance. It may well be that the individual reacts to these situations in proportion to his stability. The person who "flies off the handle" seems to go to pieces every time. The supervisor's choice is whether to ride out the situation or avoid it. Supervisors often say, "I can't tell him anything because he will get excited and rave," or "If I call the error to that girl's attention she will cry and then I'll be in a mess." What is really being said is that such people are emotionally unstable, even if the supervisors do not know the term or do not recognize the concept when it is called to their attention. A further characteristic of the emotionally unstable is the degree to which they allow one situation to affect a totally different situation. Thus a slight exchange of words with a co-worker can have the individual "tied up in knots" not only on the job but even at home after the day's work is done. Similarly, such a person will bring a home situation to the job much more often than a stable individual will.

Security must also be considered as an important dimension of personality as it affects job satisfaction. Our earlier discussion of job security suggested that security was a relative rather than an absolute concept, that security is an attribute of the individual. An insecure person will remain insecure even though his job is secure. Family background and many similar factors contribute to individual security.

One additional factor about the individual which must be taken into consideration if there is to be a complete understanding of job satisfaction is his adjustment to his life. Has his schooling led to satisfaction or dissatisfaction? This holds also for friends, hobbies, marital status, and all the other adjustments that the normal person makes adequately and with satisfaction. If the individual has a long list of "gripes" about being "done wrong," it is probable that sooner or later—most likely sooner—he will find gripes and accompanying dissatisfaction in the job.

SUMMARY

JOB satisfaction is a generalized attitude resulting from many specific attitudes in three areas: specific job factors, individual adjustment, and group relationships. Industry has been primarily concerned with measuring attitude in the first area. Although there is considerable justification for this approach, many of the studies have not been concerned with the development of measuring instruments that are capable of withstanding the rigors of scientific standards; therein lie their shortcomings. A more fruitful approach is not only to measure attitudes toward specific job factors but to try to deal with job satisfaction at the source of employment and to match jobs more carefully with the individual's intelligence, abilities, interest, personality characteristics, and previous adjustments.

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5. Industrial Morale

MORALE is a term usually applied to civilian populations and armies during wartime, its conspicuous presence or absence often being considered vital to the outcome of the war. The term is also applied to athletic teams, and here also it can contribute to success. Sport fans know that high morale can overcome many obstacles and physical disadvantages. The term is similarly applied to industry. Of late, the concept of industrial morale has received considerable attention on the part of management.

Industrial morale was defined in the preceding chapter as the possession of a feeling, on the part of the employee, of being accepted and belonging to a group of employees through adherence to common goals and confidence in the desirability of these goals. Although morale is related to job satisfaction, it is not the same thing. There is no justification for using the two terms interchangeably. Job satisfaction, as we have seen, is the result of the various attitudes the individual holds toward his job, toward related factors, and toward life in general. Industrial morale is the composite expression of the attitudes of the various individuals employed by a company. It is generated by the group, and may best be considered as a by-product of the group.

Industrial morale is definitely not an average of individual attitudes. For example, a company's morale may be low even though many employees enjoy considerable job satisfaction. Certain individuals who are dissatisfied with their job may lower the over-all morale. Even one or two completely disgruntled workers, who are not recognized as such but rather are respected by their fellow employees, will tend to lower the morale of the group appreciably. Similarly, an erratic, unpopular, or ineffective foreman will lower group morale, even though most of the factors contributing to job satisfaction are present.

Conversely a few people may have a noticeable effect in raising industrial morale even when little is offered to most of the employees in terms of the specific factors of job satisfaction. World War II showed that two otherwise similar squadrons can be very dissimilar as far as morale is concerned. Morale in similar departments in a factory often varies in ways that cannot be understood by studying the job satisfaction factors. An individual or a few members of a group can raise the morale of the entire group if his attitudes and behaviors can be adopted by the others.

The fact that morale is a by-product of the group and can often be generated by small segments of the group is important. It explains many of the paradoxes that are connected with morale. For example, the discharge of an inefficient and troublesome worker may have no effect on the morale of the group if it has not considered him a part of it; the group will regard this as a single and separate event. However, if he was liked by the others and they feel that he was not really troublesome and inefficient, then the group's morale will go down. On the other hand, if his fellow employees dislike him and hope that he will "get his," the group morale could conceivably be raised by his discharge. Another paradox in regard to morale is the statement that workers strike when their morale is low. This is contradicted by union organizers, who insist that morale must be high before a strike call can be promulgated. Now morale cannot be both high and low at the same time in the same group of workers. Obviously, in interpreting such statements about the group's morale, the point of view must be considered. From management's point of view, the morale is low if workers side with the organizer; but from the union's point of view under these circumstances, the morale is high.

DETERMINERS OF MORALE

MORALE can best be understood in terms of four determiners. The most outstanding determinant is a "feeling of togetherness" or group cooperation. The second is the need for a goal. Third, there must be observable progress toward the goal. Fourth, the individuals in the group must have specific meaningful tasks that are necessary to the achievement of the goal.

Employees in a normal work situation rarely ever function as totally isolated individuals. Whether management is aware of it or not, the workers are likely to form a group or a number of subgroups. The ideal situation, and one which makes for the highest morale, is one in which there is a single group that includes all employees, the representatives of the employer, and the employer. The extent to which management attempts to achieve this is the extent to which morale is likely to be present. Unfortunately, the factor of group formation is too often overlooked in industry. The introduction of favorable environmental factors such as changes in illumination, music, or air conditioning may or may not work, i.e., increase production. In and of themselves such factors are unpredictable. The key to whether they will work lies in the group's reaction to the change. If the group believes that the change will benefit it, the reaction will be favorable. On the other hand, if the group is suspicious of the change, it will resist it. Changes instituted by management, with the most altruistic intentions, often boomerang because management has overlooked the importance of the "feeling of togetherness," or group cooperation. It cannot be assumed that increasing material efficiency necessarily increases people's capacity to work together. In fact, unless management takes specific steps to encourage the formation of a group that includes labor and management working together, the employees are likely to form their own group and deliberately exclude management. Management's best chance for inclusion is the adoption of a democratic group structure and the providing of an opportunity for the four determiners of morale to function.

It is impossible to deny the existence of a social structure in any company. To do so is to refuse to face reality. But management does this when it insists that people work solely for money. Men and women lead a social life on the job; they make friends and enemies; they exchange confidences, meet socially after hours, eat together, and do favors for one another. In short, consciously and unconsciously they form groups. These groups can be the basic core of morale formation if management will only recognize this and if it can funnel this energy into the proper channels of cooperation. Management's failure to recognize this leads to many of the mistakes it makes. Technical changes result in social changes; and while the technical changes may be logical from management's point of view, they are often unsuccessful because the social changes which accompany them have been overlooked or miscalculated.

Promoting group cooperation is easier if the group has a goal to achieve. The goals in industry may be more obscure than such goals as winning a war or a football game but with proper guidance they can be made clear. Doing the best one can on the job may constitute a goal, provided the employee receives evidence that this goal is understood. Advancement, security, increased earnings, and individual and group welfare can all be goals, provided management encourages such goals and the employee has evidence that they are real and attainable.

Some "scientific managers" have suggested that slogans are an excellent means of increasing morale, on the assumption that a good slogan may very well become the goal. This is best illustrated by the story about a big boss who attended one of these "scientific" sessions and was impressed by the suggestion. He set the slogan "Do it now" as the goal and had it posted in various conspicuous spots in the plant. From his point of view, this goal was anything but desirable, for the bookkeeper immediately absconded with the company's funds, the salesman married the boss's daughter and the office boy threw the inkwells into the electric fans.

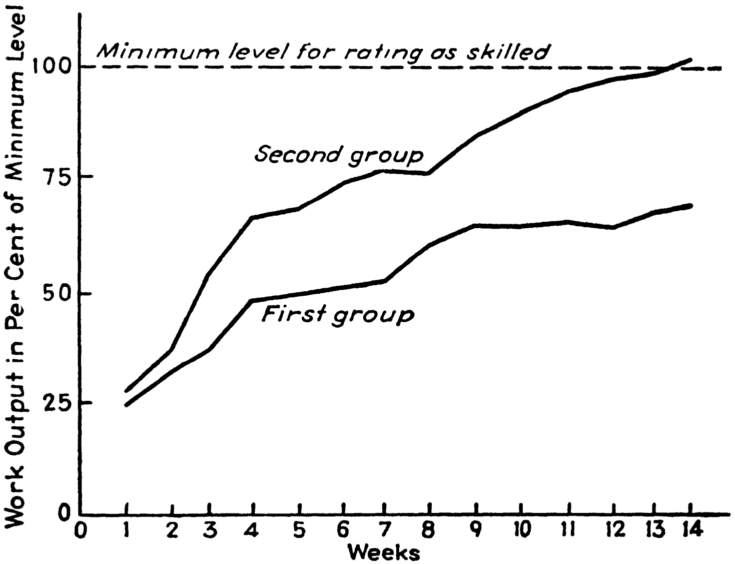

Fig. 6. Effect of Observable Progress Toward Goal. (Figs. 6 and 7 from G. Watson, ed., *Civilian Morale*, Henry Holt and Company, Inc.)

In addition to having a goal, it must be possible for employees to make observable progress toward it. A good example of this is seen in Marrow's work in his own plant (7). One group of power machine operators were told the level of production they would have to reach within 14 weeks. Another group were told the final goal but were also given weekly goals; 66 per cent in this group reached the goal. Fig. 6 shows the effect that a too distant goal which the worker judges to be unattainable has on performance.

The last of the four determiners of employee morale involves specific meaningful tasks for the individual in the group to perform, and a sense of participating in the group's work toward the goal. If the group's goal is 1000 units per day, each individual member must understand clearly how his specific job contributes to its attainment.

TABLE 17. Distribution of Morale Scores

Morale Score	Percentage of Group
90–100	13.5
70– 89	41.3
50– 69	31.1
30– 49	11.6
10– 29	2.4
0– 9	0.1

If the output is merely to management's advantage and does not contribute in some definite way to the employee's advantage, the goal is likely to be regarded as management's and not the worker's. However, if the employees are consulted about setting the goal and actually derive a fair share of the benefits that accrue, there is then a strong goal. Even a floor boy can see how he contributes by helping the assemblers, although he does no assembling. The first workman passes his completed share of the unit on to the second worker, and this continues, with every member of the group participating in a meaningful way in the achievement of the goal. This is morale.

Hull and Kolstad (*4*) report the results of a study in which the morale of 43,962 employees in 141 separate employee populations was measured. The value of such extensive work is that it enables morale in one company to be compared with that in other companies and the factors contributing to higher or lower morale to be isolated and interpreted. Since the specific scale is not given, no comment can be made as to whether morale, job satisfaction, or specific attitudes were measured. But, since both men are recognized authorities, it can be considered probable that something really basic to morale was measured. The distribution of morale scores among these employees is shown in Table 17. The average morale score on this scale is 69.7. Hull and Kolstad concluded that the results failed to show high relationship between morale score and type of work done. They found no significant relationship between morale and general wage level. However, there was a definite relationship between tenure of employment and morale. The morale of employees who have worked less than one year and those who have worked more than five years is higher than that of the one-to-five-year group. Managers, foremen, and supervisors rank higher in morale than do rank-and-file employees, as Fig. 7 indicates.

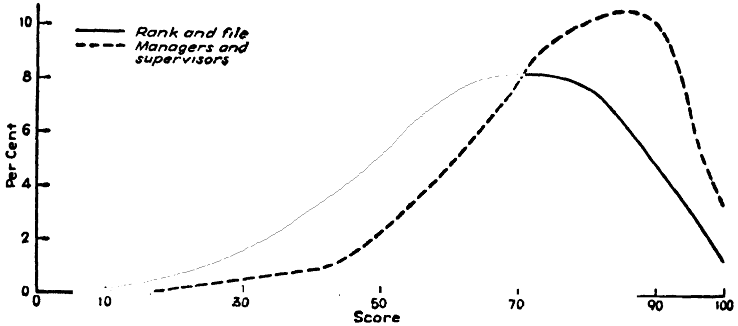

Fig. 7. Distribution of Morale Scores of Rank-and-File Employees and Superiors.

Hull and Kolstad say that the psychological satisfactions that come from day-by-day recognition of and respect for the employees' personality are just as important for morale as pay, hours of work, and working conditions. They also are convinced that the foreman plays a large part in determining employee morale.

MEASUREMENT OF MORALE

THE best single measure of morale is one that measures the group and subgroup formations. A technique has been devised for this purpose by Moreno (*8*); he has called it sociometry. Jenkins (*5*) has modified Moreno's technique and called his method the "nominating technique." He has used it with considerable success in studying morale in the Navy. Further reference to this work will be made in Chapter 13.

The technique is simple. Each person in the group is asked to name the person in the group whom he considers the best worker, or the one who would make the best supervisor, or the most fair-minded person. Each individual is represented on a diagram by a circle; an arrow is drawn from it to the circle representing the person he names. The leader of the group is he who receives the greatest number of choices. If this individual is also the boss, then he is both the formal and the informal leader. However, if the formal leader does not receive many choices, it is immediately apparent that he is leader in name only and that the informal leader, if there is one, is the real force in the group. This person is known as the "star." Actually, there may be more than one star in a group. A person who is never chosen is called an isolate; he may be so unimportant that if he dropped out of the group, its structure and morale would not change. Sometimes two workers choose each other. Such individuals are usually known as "mutual admiration societies" and may function as separates rather than in the group. A triangle occurs when X chooses Y who in turn chooses Z; this is the beginning of a subgroup and may be enlarged into a clique. Figs. 8–10 are simple sociograms that illustrate some of the various types of group structure.

In actual practice, sociograms may become very complicated. Fig. 11, showing a sociogram made by Jenkins in his work with a Navy squadron, illustrates the complexities.

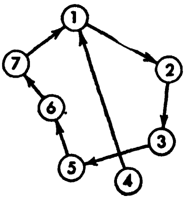

FIG. 8

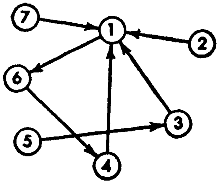

FIG. 9

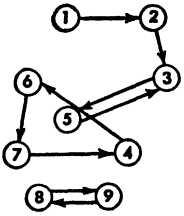

FIG. 10

FIG. 8. Sociogram of a Cohesive High-Morale Group Without a Strong Leader.

FIG. 9. Sociogram of a Group with a Strong Leader.

FIG. 10. Sociogram of an Unstructured Group with Cliques, Isolates, and Mutual-Admiration Societies.

The study of sociograms is valuable. It can furnish leads as to clique formations and the extent to which they may act as disruptive influences in the organization. It can substantiate observations which formerly may have led merely to suspicions. It can pick a potential leader far in advance of any principle of seniority. A sociogram is much more than a popularity poll.

But in measuring the other three determinants of morale—goal, progress toward goal, and meaningful participation—the sociogram is of no value. In order to obtain objective data in these fields, the attitude scale, the questionnaire, or the interview has to be used. The material already presented has indicated the approach and method that should be chosen.

The suggestion that the sociogram, together with questionnaires, attitude scales, and interviews, affords the best measure of morale has been made without overlooking the

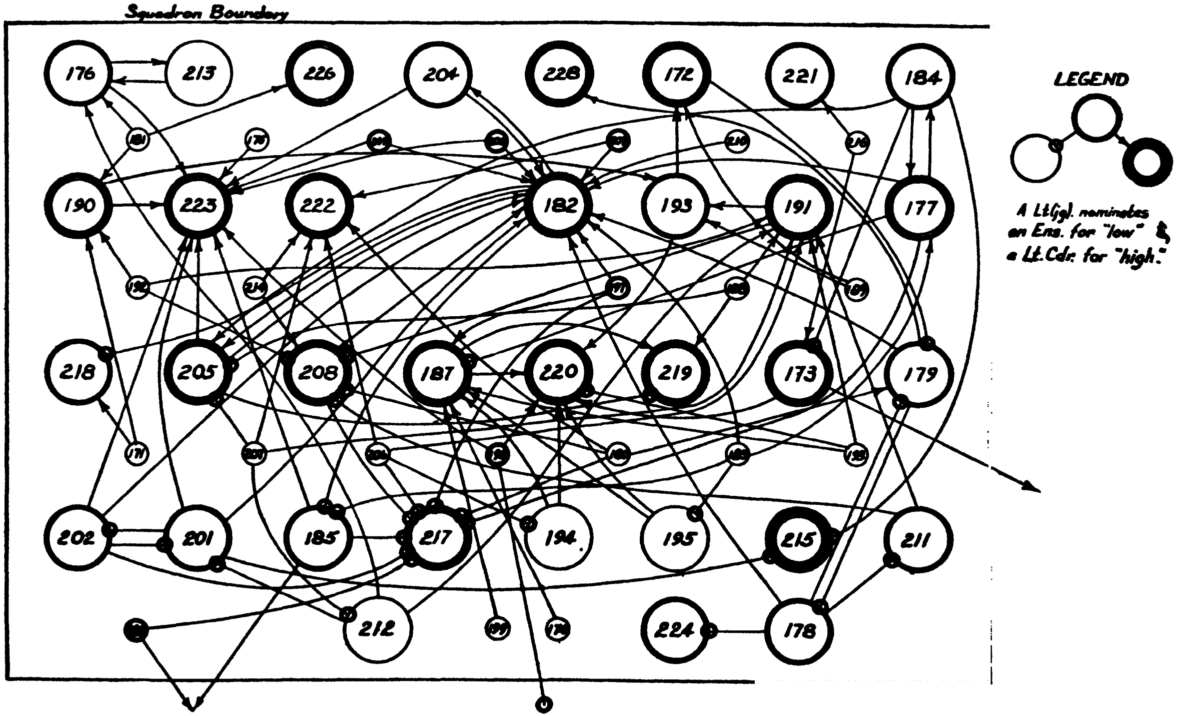

FIG. 11. Sociogram of a Navy Squadron. (By permission of the Navy Department.)

many indexes that are usually considered measurements of this factor. Among these indexes are strikes, labor turnover, absenteeism, grievances, suggestions, and production figures. The difficulty with them is that they may be due only in part to morale; there is no certainty as to what extent other factors enter the picture. For example, a strike may indicate not low morale but a reflection of business conditions. Similarly, workers with low morale may not dare to strike because they feel much too defeated and beaten; in this instance the absence of a strike is due to low rather than high morale. Nor can absenteeism and labor turnover always be looked upon as indications of low morale because conditions in the labor market, the weather, and other factors may induce such behavior on the part of the worker and hence be only partial reflectors of morale.

Workers whose morale is high may want to make suggestions but refrain from doing so because other employees may resent their ideas. Roethlisberger (*10*) cites one company that turned its employee suggestions over to a judgment committee and made suitable awards. Management posted the notice of awards on its bulletin boards in order to stimulate further suggestions and give the winners recognition. This well-meaning program created increasing dissatisfaction. Foremen often discriminated against workers who won when the suggestion related to work within the foremen's area of responsibility, for they interpreted such suggestions as criticisms of their work. Likewise, workers whose jobs were simplified as a result of the suggestions, and who consequently received lower pay rates, put pressure on the person responsible for the suggestion. In addition to these troubles, when the winner owed money, claimants appeared and asked the company to settle on the basis of the employee's "windfall." Management finally had to modify its procedure and publish awards by code number, thereby eliminating the recognition factor which had been part of its original intention. To put it briefly, this suggestion system did not develop or promote cooperation, and consequently it served to lower rather than raise morale.

METHODS OF INCREASING INDUSTRIAL MORALE

THE measurement of industrial morale serves as a barometer to management. If the findings indicate low morale, this must be regarded as a challenge, and steps must then be taken to improve it. Four methods have been used to increase industrial morale. In order of frequency of use, but not necessarily of advisability, they are:

1. Expert approach.
2. Industrial spy.
3. Industrial counselor.
4. Employee problem approach.

The *expert approach,* the most frequently used technique, has resulted in mixed success and failure. The basic feature of this approach is the use of an "expert" in making a spot survey. He tours the plant, talks to key people, and writes a report in which he gives advice. Sometimes he suggests any or all of the following items: posters, slogans, speeches, parties, or welfare associations; these are likely to give morale a slight spurt for a short period. When things lapse back to normal, the company calls in another "expert." Since it is now somewhat more critical, it shows him the previous report and intimates that things did not go as predicted. Of course the second expert knows this, for otherwise why would he have been called in? This being the case, he has to produce some new devices for boosting morale. He suggests bowling contests or better cafeteria meals, an effective house organ or a suggestion system. Again there is a slight lift in morale for a short time and then things take a turn for the worse.

The point is that any or all of the five suggestions of the first expert might work under certain conditions, but the conditions are never suggested or complied with. This is true also of the four suggestions of the second expert. These nine suggestions do not by any means exhaust the list; there are many, many more. Some companies and their executives seem to thrive on them. When any of the suggestions promote group cooperation, establish goals, allow for observable progress toward goals, and present an opportunity for employees to participate meaningfully and actively in their achievement, then they can increase morale. Checking the above list of suggestions makes clear that few in themselves encourage cooperation or meet the requirements of the other determiners of morale. The writer is reminded of a dance given for employees of a large company which was supposedly promoted by their "benevolent association." It was a full-dress affair and the president of the company was present to show that he was just one of the boys, and to award prizes. Early in the evening two of the employees put on an unscheduled dancing exhibition. In uninhibited fashion, they twisted, turned, and contorted, to the delight of the huge circle which formed around them. The president's reaction to what he considered a shocking and revolting performance was to order it stopped immediately and to warn the couple about conduct unbecoming ladies and gentlemen of the X Company. Needless to say, he effectively dampened everyone's spirits and unknowingly made himself very unpopular. Most of the employees felt that if he "couldn't take it" he should have stayed at home; besides, he wasn't their boss on Saturday night. The morale was lowered far out of proportion to the slight increase that such a party could have created.

The *industrial spy* technique, although dangerous, is frequently used as a means of increasing morale. An expert whose true identity is unknown to the employees, and usually to many of the executives, is given a job in a plant under the guise of an ordinary worker. It is his task to gain acceptance as a fellow employee and thus acquire intimate knowledge of the group and its complaints. He puts this information into a report. Sometimes such reports do not refer to specific employees, but deal mainly with uncovering environmental conditions and technical difficulties which, in his opinion, lower morale.

The ethics involved in this type of report are not as distasteful as in the case of reports which take advantage of the confidences gained by the "spy" to locate the individuals who, according to management's definition, are "agitators" or "troublemakers." Sometimes union organizers and members are put in this category. Eventually, the "spy" disappears as suddenly as he appeared and the workers wonder about what happened to that "nice guy." His recommendations are acted upon later in the form of dismissals for "just cause."

Some readers may be sickened by such tactics, but to those who believe that all is fair in love and war this technique is very appealing. It should be emphasized that not all industrial "spies" are dastardly. Some do a very ethical job and their reports show that they are really concerned with employee welfare and increased morale. Some even go so far as to place the blame on ineffective management when they find that this is where the trouble lies.

The *industrial counselor* has none of the unpleasant connotations that are attached to the industrial spy. As we saw earlier, the Hawthorne Studies culminated in the suggestion that the industrial counselor is useful in increasing morale by improving relations and acting as a communication channel between employee and employer. The employees are told that the industrial counselor is a representative of the personnel department, and they are paid their average earnings during the time they spend talking with him. Experiences at Western Electric indicate that employees are willing to bring their problems to a counselor and will talk openly and freely to him.

Although the industrial counseling programs has been useful in aiding supervisor-employee and employee-management relations, it has also been valuable in improving the personal adjustment of the individual employee. A case cited in *Fatigue of Workers* (*9*) is a good illustration of this point.

One day an assistant foreman called the attention of the counselors to a problem which had been worrying him for some time. The problem was a man of forty-eight who had had about twenty years of service with the company. His history was as follows. In his early years of service he was apparently an efficient worker. He was made a group chief in 1923 and remained in that position until 1931. But at that time he was considered one of the least efficient supervisors in the group, and thereafter his fall was gradual but steady. He was demoted from job to job, and in each successive job he failed to measure up to the proper standards of work. When the foreman consulted the counselors this employee was at work on a job of the lowest grade, being paid considerably more than this grade warranted, and not earning his money. These were the essentials of the problem as they appeared to the heads of the department when the foreman called in the counseling organization. "They felt that they had given the employee every possible opportunity to make good and that he had failed. They also were disturbed because he appeared to be drinking heavily, and, more recently, because he was not at all cooperative."

The department proposed to shift the employee to a grade 1 (lowest grade) job in another organization and cut his hourly rate to the minimum of the grade. They proposed to explain to him that this would be his last chance and that if he failed he would be dismissed. In the meantime a counselor had been at work. He had had a preliminary interview with the employee which had indicated that the employee's failure was the result of a personal maladjustment. He asked that the transfer be delayed a few months or until a detailed study of the case could be made.

The study consisted of interviews with the employee, a thorough physical examination, several intelligence and vocational tests, and a careful investigation of the employee's supervisors, his associates on the job, and the mechanics of all the jobs on which he had failed. Here the report may be cited again: "The interview showed an employee who was raised in one of the west-side slum districts. The family consisted of two older sisters, an older brother, the employee, and a younger brother. The mother died when the employee was very young, and he does not remember her. The older sister managed the house. The father was a strict disciplinarian. The children were punished frequently and they were not allowed ordinary liberties. This was so pronounced that the older brother left home as soon as he finished school. The father was employed as a laborer until his death, which was shortly after the employee graduated from grammar school. The employee worked during vacation time while he was in seventh and eighth grades, and he found a steady job immediately after leaving school. He worked for several concerns until he enlisted in the army during the World War, and when he returned at the age of twenty-nine he was employed at Hawthorne.

"During this time he formed a close relationship with his older sister who never married. She kept house for him until a few years ago when he moved to a hotel across from the Plant. This move was made during the period when he was having difficulty on the job, but he continued to contribute toward her support and still has a very loyal attitude toward her."

Such was the past history of the employee, as it was revealed in his interviews with the personnel counselor. His attitudes in the immediate situation were described in the report as follows:

"1. Fear of the supervisors (foremen especially). Belief that they had it in for him. Feeling that they were watching him all the time. He could feel the foreman's eyes on him when the foreman was at the other end of the room.

"2. Belief that his nervousness was a 'shell shock' hangover from the war, in spite of the fact that he was in good health for years after the war and was not nervous until recently.

"3. Fear of sickness. He had been under the care of several doctors who tried to convince him that he was all right. He took 'nerve medicine' regularly four times a day. His closet shelf was full of pill boxes and cold cures. He wore a jacket on days when it was so hot that his shirt was wet with sweat. He talked of his health, his sister's health, boyhood friends who had terrible diseases. He went into a tantrum if the hotel room was cold or the department was drafty.

"4. His only associate outside the Plant was a tubercular war veteran with a shady character, and he did not see him often. Most of his time was spent in his room with a cheap magazine. He also did not talk to anyone in the department unless they asked him a question."

The method used in dealing with the employee was typical of personnel counseling. He was interviewed daily until he had expressed much of the emotional disturbance in his thinking, and in expressing it, freed himself from it. Thereafter, the interviews were limited to two a week, and the counselor concentrated on helping him to think sensibly about his work, his supervisor, and his associates outside the Plant. As soon as an improvement was recognizable, the counselor went to the proper group and section chiefs and asked them to talk about the employee. They were asked to express their criticism in as much detail as possible. The counselor did not differ with any of the opinions expressed except to make the general comment that he thought the employee's attitude had improved. This process was carried so far that the counseling organization did not object when the division chief called with the information that the employee's hourly rate would have to be cut. This event occurred six months after the case had been opened. The organization asked only that the explanation be given to the employee in terms which would carry conviction to him. Later the organization attempted to assist the section chief in preparing a statement for the employee, and in this conversation the section chief found his case very weak and decided to do nothing.

The report continues as follows: "This approach to the problem has resulted in the following changes in the situation:

"1. The supervisors are taking a genuine interest in the employee and they are helping him with encouragement instead of criticism. Both the group and the section chiefs are now taking personal credit for the improvement and they claim to have made arrangements to assign him to higher graded work in the near future.

"2. The employee has increased his efficiency from between 60% and 70% to about 100%. There appears to be little lost motion in his activities on the job, and he appears to be getting a real feeling of satisfaction in doing his job better than the rest.

"He is also very friendly with all of the employees, both men and women, who work near him, and he spends his rest periods talking with a group of employees who work in the other end of the room.

"He has developed several close friends in the hotel and he occasionally joins a group playing pinochle. He has been keeping steady company with a girl whom he expects to marry. They plan to move to a furnished apartment. Due to her influence he spends several evenings a week at the movies and dances, or with their friends.

"About a month ago he quit spending his money on doctors. He takes no medicine and says he feels better than he ever did. He has discarded the jacket that he was continually wearing and observes that he is no longer troubled with colds. This is interesting because he said he always had a cold about this time of the year. The only remnant of the old attitude toward sickness is his excuse for marrying. He says a man of his age needs someone to take care of him.

"From a social point of view, this employee is now in working equilibrium with his environment. His attention is on the job. The supervisors appreciate his efforts; the new employees respect his knowledge of the job, and the older employees are friends instead of sympathizers. The concentration of our efforts on a personal adjustment without taking into account the other areas—supervisor, associates, and the job itself—would have probably resulted in failure. The total adjustment depended upon work with the employee's attitude, the supervisor's attitude, his associates' attitudes, and with assistance in studying the job and developing an appreciation of coordination of activities."[1]

The industrial counselor can be helpful in increasing morale because he is in a position to promote group cooperation and to help the person see the goal, his advancement toward it, and the meaning of his work in relation to achieving it. The only trouble with this method is that it does not go far enough; it may be merely a substitute for the employee's self-expression rather than the expression itself.

The fourth and most promising approach in increasing morale is the *employee problem* technique. It has not been used as widely as the other three but has many advantages over them. However, it requires skillful handling and for that reason many people are unable to use it. Since it attempts to put democracy to work, this method deserves serious consideration.

In the problem approach, the foreman, the boss, or best of all a trained psychologist (who does not play the role of expert) presents a currently pressing problem to the employees, and then, with a minimum of interference but some guidance, allows them to work it out for themselves. Obviously, group cooperation is a natural by-product of this method and this in itself constitutes an important factor in increasing morale. In working out the problem, the employees establish a goal: the solution. They see the progress they are making and they actively and meaningfully participate in the effort to solve the problem. Hence all the determiners of morale are present, and increased morale is automatically achieved along with the solution of the specific problem.

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[1] From National Research Council, *The Fatigue of Workers*, copyright, 1941, by Reinhold Publishing Corporation.

The types of problems that can be used are almost limitless as long as they concern the specific group. Work hours, production increases, vacation schedules, and overtime work, as well as the many irritations which arise from day to day, are all suitable for this technique.

In the employee problem technique, a group meeting is called and the problem is briefly presented by the discussion leader, who may be an outsider, an employee, or the employer. Whoever he is, it is important that he be trained in the art of conducting a democratic meeting. He must encourage free discussion and he must be in a position to assure the group that the management will respect its final recommendation. In the first meeting the group is usually silent for a short time, but someone eventually speaks up and then there is bedlam. Within a few moments, there will be shouts for order and one person will manage to be heard above the others and thus gain the group's attention. One view is discussed after another, and finally someone suggests that a vote be taken. It is important that no pressure be put on the group to reach a decision and that the leader handle the discussion in such a way that no one will get the impression that he is steering the group toward a certain decision. It is not necessary for these group meetings to be held regularly. One or two discussions on a specific problem are usually sufficient. When the group has reached its decision, it will stick to it and, what is more, feel proud of it and of its members.

Three brief examples of this technique will be given. Students in the writer's classes purchase a number of books which they leave in the library for their exclusive use.

Soon some student complains that he cannot get his book because someone has removed it from the library. At this point, the instructor calls this to the attention of the class and asks it what, if anything, should be done. There is the customary short silence; then many students speak at once and no one can be heard. Within a short while they recognize this and either calm down or ask the instructor to act as chairman. He calls upon one student to present his view. If his ideas are unpopular, others make suggestions. The interesting point is that semester after semester each group finally draws up a code of conduct. The usual decision is that all books must remain in the library except over week ends, when all but two of them may be taken out from Friday afternoon until Monday morning. Do the students ever break these rules? Of course not. To do so would mean breaking rules they themselves formulated, and relegating themselves to the position of social outcasts. Incidentally, the library has its own rules regarding fines on books kept out after the due date, and the students willingly pay the fines.

A high-school principal who took a seminar which the writer conducted and in which the democratic principles governing group behavior were used was very sure that this method would not work. After about six weeks she came to a session and announced, "I'm tired, but I found out that democracy works." Urged to explain, she went on:

> I've just conducted a faculty meeting democratically. It was exhausting for me—but it worked. You see, we've always had trouble about advisers for after-school clubs. The teachers always say they're too busy and they refuse to take on the job. This year they insisted there were too many clubs, and they wanted me as principal to decide which clubs should be eliminated. I turned it back to them, and asked them to discuss the values of each club and then decide which ones should be discontinued. As they talked, they decided every single club was important. They voted to keep every one, and each club

got an adviser. I learned something; being democratic is not only a good theory—it brings results (*1*).

Although these two illustrations have been drawn from groups with above-average intelligence, the method works equally well with people of average intelligence. The success of this method is not a function of the group's intelligence. For example, the employees of a factory that manufactured curtains complained to the boss that the rate set on a particular item was too low, and they threatened to quit if it were not raised. Actually, the rate was fair and was equal to the previous average earnings, and the boss believed that he could not increase it. Using the employee problem method, he called the group together and presented these facts. He also told them that he was concerned about the problem and wanted to see it worked out fairly for everyone. First came the suggestion to grant the increase, whereupon he told them that in his opinion the time study had set the rate fairly. Then an employee suggested that they time the operation. The boss had nothing to lose by doing this, because the rate had been set honestly in the first place. The group then arranged to have some employees work on a few bundles of curtains and to have other employees do the timing. The necessary simple calculations were made and the facts presented to the group. They decided that even though they did not like the "number" they would do the job since their earnings would not be reduced. The employees felt better because they knew they were not being cheated, and the boss not only prevented employee turnover and a money loss but gained increased respect. He is very different from the authoritarian, "do it—or else" type of employer.

The Four Methods of Increasing Morale in Operation. The adjustment of windows is not only a time-consuming affair in almost any office or factory but one that leads to almost continual friction and lowered morale because it breaks the employees up into at least two groups—"the window open" or "we need air" group and the "window closed" or "we'll get sick" group. If the supervisor refuses to settle the question arbitrarily, there is likely to be a continuous procession to and from the windows. This is a small but nonetheless serious problem which affects morale and which must be handled carefully. Let us see how it can be solved by each of the four methods of increasing morale.

In the first method an expert is called in. He makes a study of the plant and comes to the conclusion that fans or air conditioning, or both, will solve the problem. The boss may reject this recommendation because of the outlay of capital required, or he may install an air-conditioning system at considerable expense only to find that some employees still want the windows opened because they need fresh air. The second method employs a "spy." Unknown to the employees, he observes what goes on and he makes frequent trips to the lavatory so that he will have a full set of notes. He finally spots the person who is causing all the trouble and those who are on his side. The "spy" may suggest that someone be fired or he may present an "ideal" seating arrangement for the group. But even if the ringleader is moved away from the window, there is always someone else who will take the lead in the fight, so the problem remains unsettled. Furthermore, the "ideal" seating arrangement does not work out because it is not likely to take status and sociometric principles into consideration. With the third method, an industrial counselor interviews a number of employees. He finds that one employee was scared by an open window when he was two years old, whereupon he prescribes therapy that enables that individual to be a happier and better-adjusted person.

The fourth method, the employee problem approach, affords the best means of solving the problem. The boss or supervisor calls the group together and says, "We have quite a problem on our hands with the continual opening and closing of windows. Now let's not act like children; let's try to work it out." There is some laughter and then the employees start making suggestions, such as: "Let's have a schedule and keep the window open for 15 minutes every two hours." "Let those who don't mind open windows sit near them." When one of the group says, "We need air conditioning," the boss tells them that he has already investigated this possibility and that it will cost more than the budget allows. The group may then make other suggestions or decide to try one of the first two. If the discussion is not hurried and no pressure is put on them, the employees are likely to come to an amicable decision, such as trying the first suggestion for a month and then calling another meeting if there are still objections. The point is that the group makes the decision of its own free will and its members will be reluctant to break the rules because they may be considered poor sports. Although some of them may change their seats, there will be a marked decline in raising and lowering the windows.

Another petty problem in morale that often arises, especially among women in offices, is the "body-odor" problem. Someone accuses one girl of having "B.O." and whether she has it or not, the other girls will refuse to work with her and insist that she be fired. Obviously a group discussion of this problem as it applies to one girl is inadvisable and should never be used. Here is a tender but tense situation, which is best handled by the industrial counselor. If the accusation is unfounded—as it often is—he tells the girl about the unfair attack and tries to help her become accepted by the group. He may even have to speak to the leader of the persecuting group about the unfairness and the prejudice involved. On the other hand, the girl may have a distinct body odor. If this is a medical problem (the intense and constant cases sometimes are), he should refer her to a physician who will treat this condition after determining its causes. Other cases of B.O. involve the problem of body hygiene, and once a person is aware of her susceptibility she is usually willing to take the necessary precautions. The reason for mentioning this type of problem is to emphasize the fact that in handling individual problems of a personal nature the group technique should not be used, for it can result, psychologically, in more harm than good to the individual. The group approach to a problem related to the group not only solves the problem but provides a promising means of increasing or bolstering morale.

SUMMARY

Morale is a by-product of a group and may be generated by small segments of the group. It has four determiners: group cooperation, need for a goal, observable progress toward the goal, and specific tasks of a meaningful and participating nature which can move the group toward the goal.

Morale can be measured by means of sociograms which enable us to understand the group structure. The highest morale is found in a well-integrated group which has a "star" who is both the formal and the informal leader. The other aspects of morale can be ascertained through questionnaires, scales, and interviews that determine the existence and practicality of the goal and the group's progress toward and participation in the goal.

The methods used to increase morale are the "expert," the "spy," the industrial counselor, and the "group problem" approach. The group problem method is most likely to succeed.

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6. Incentives

MANAGEMENT often spurs production by offering employees one or more of many types of incentives. Throughout the years production has increased for many reasons, in addition to the particular incentives offered. Although the increase has often been attributed to the incentive plan in operation, such conclusions have not been warranted in every case. In fact, production sometimes has risen in spite of the incentive plan.

Industry has generally overlooked the complexity of human motivation and has erroneously oversimplified a highly complex phenomenon. Since the psychologist is especially concerned with understanding an individual through his motives and has acquired a body of knowledge in this field that often differs from the layman's knowledge, it is necessary to review briefly, from the psychologist's point of view, what is known about motivation at the present time

THE COMPLEXITY OF MOTIVATION

THE one thing that psychologists know is that an individual rarely if ever behaves in a situation or responds as a result of a single motive. They clearly recognize the complexity of human behavior and understand that a person often does not know the true reason for his behavior. Because of this complex behavior an individual is, in many instances, unpredictable.

A major error in industry has been the oversimplification of the concept of motivation. Too often since Taylor's time (see page 202) it has been assumed that the primary reason why people work is to make money. This is both absurd and unquestionably false. Man in industry is just as complex as man in any other phase of life, and any attempt to reduce his behavior to a single system of motivation must result in artificiality and narrowness. Man has many motives; and unless we recognize the part played by each one we cannot possibly begin to understand his behavior.

When the psychologist talks about motivation, he is concerned with studying the individual with respect to ever-changing physiological conditions and a multitude of previous experiences. Because of these two factors, physiological changes and previous experiences, it must be recognized that motivation may stem from within an individual or from factors acting on him from the outside. Furthermore, these two categories are not mutually independent; on the contrary, they interact at all times.

The simpler motives originating from physiological imbalance within an organism are generally known as hunger, thirst, oxygen need, the need for rest and sleep, and sex. A good many motives act on the individual as a result of the multitude of his experiences; these are in large part determined by the social pressures of the society in which he lives. Although these social motives are sometimes given only vague and indirect expression, they nevertheless must be recognized as just as important as the so-called simpler motives if we are to be successful in understanding why man behaves the way he does. Gregariousness, self-assertiveness, acquisitiveness, the desire for prestige and the desire to conform are only a few of the many social motives that act on man.

In the integration of the behavior of any normal individual at any one moment many motives are present. The particular behavior that results will depend in part upon the physiological imbalance of the individual, and also upon the social pressures of society. For example, a man may be hungry; but if his religion tells him not to eat meat on Friday or bacon at any time, he may go without food. Thirst can be satisfied most easily by water; but the influence of advertising results in our drinking the many "colas," or beverages that are likely to affect our emotional behavior and that actually have little to do with satisfying the original thirst drive. While it is true that a certain amount of the sex drive is physical, the prohibitions, inhibitions, and repressions are determined so completely by the pressures of society as to lead some people to recommend that young people go in for athletics and take long walks rather than think about this drive.

Motivation is truly complex. Different forms of behavior are sometimes similarly motivated. A desire to be outstanding or to acquire prestige may cause one person to write a book (this is not the author's motive) ; another may decide to achieve this by dressing effectively, another by marrying well, and still another by remaining single. The next person may decide to fulfill this desire by acquiring wealth. We can go down the list of all the different ways of behaving to achieve this one end. All these different forms of behavior may lead to the same amount of success by achieving the same end. The converse is also true. Different motives may sometimes result in one form of behavior. Thus a person may write a book because he wants to acquire wealth or gain prestige or have an opportunity for self-expression or creativeness.

To complicate matters further, people often do things without being aware of the basic motive or motives involved. The person who is fired may honestly believe that the foreman was biased, instead of realizing that the reason for dismissal is inefficiency. Giving "good" rather than "real" reasons for behavior is known as *rationalization,* a dynamism of which there are many examples. Sublimation, projection, identification, and compensation are a few of the forms of behavior in which the real motive is unknown to the individual. The neurotic does not generally understand why he really is neurotic, although he may know that he is neurotic. A psychotherapist is needed to help him understand the basic motive compelling the particular form of aberrant behavior.

The vocabulary of motivation is large. Such terms as motive, purpose, desire, goal, preference, attitude, and incentive all have their place. Regardless of the particular word applied individually at any given moment, a person is likely to have a number of motives, drives, incentives, desires, wishes, and purposes operating at the same time. Whether they are consciously present or are unconscious, many of them act upon the individual simultaneously. It is therefore safe to expect a normal person to be in conflict some of the time. A child trying to decide between candy and ice cream is in conflict. An employee who wants to tell the boss off but also wants to keep his job is in conflict. An employer who must decide whether to sell an oversupply of a commodity at a loss or hold it a little longer is likewise in conflict. Furthermore, a decision once made does not necessarily resolve the conflict.

Drives or motives vary in strength not only from one individual to the next, but within the same individual at different times. Sometimes the immediate goal is at cross-purposes with the distant goal, even though both are desirable. Of course if we could know all there is to be known about the various motives that operate both within the individual and from the outside and, further, if we could know the relative strength of these drives in him at the particular moment, we could predict behavior accurately. But since present-day knowledge in psychology has not reached this stage, predicting behavior is extremely difficult. The factory worker may work overtime or not, depending upon whether he believes he needs a rest has a date, wants to "get in good" with the supervisor, needs the money for food or clothing, or works just for the sake of earning money. Intimately tied up with motivation are man's various emotions; so fear, anger, joy, or just no feeling at all will also enter into his decision on how to answer the boss's simple question: "Will you work overtime tonight?"

A man on a job never works in the vacuum of his job. Therefore, man's conflict in industry is just as real and just as complex as a conflict that a psychologist or psychiatrist studies in the office. The decision to strike, to quit the job, to ask for a salary raise, to talk back to the boss or to argue with a co-worker rarely if ever results from a single motive. This is true, regardless of the fact that the employee, when requested to explain his actions, may give a single reason. Known or unknown to him at that time are the consequences of satisfying the various physiological needs and the social drives operating in the situation and in him.

Young people can be expected to act differently from old people; if they act in the same way, it is usually because of different motives which occupy different relative positions. Married workers will act differently from nonmarried workers. Men will act differently from women on a job because on the job they have different motives, or motives of different relative strengths.

The production manager of a large factory employing young women recently complained of the high turnover rate, despite the fact that job security was offered and the company had the proud record of never having dismissed a single employee for lack of work. In addition, it paid fair competitive wages and offered many inducements such as bonuses, music, good lunches for thirty-five cents, and other things. The company was considering the possibility of introducing psychological tests to reduce the labor turnover. In this case it does not appear that such tests would decrease the turnover to any appreciable extent. They might be useful in shortening the training period and thus be moderately helpful. Labor turnover here is a reflection not of the girls' ability or the company's practices; it is a function of the fact that this firm employs young women who have many reasons for leaving a job, including the possibility that they may have a greater desire to marry than to continue working. Perhaps hiring older women or men would reduce this company's turnover. This illustration is not to be interpreted as a bias for or against hiring young women. Since this factory is very successful despite its high turnover, it might be that a change in its personnel policies would create other problems such as modification of the wage structure or changes in the method of supervision.

OVEREMPHASIS ON FINANCIAL INCENTIVES

IN VIEW of the complexity of motivation in man, it can be definitely stated that industry has overemphasized the importance of financial incentives. Some people believe that money is the only incentive in industry, and many believe that it is the most important incentive. This false premise, and oversimplification, have caused many of the best-laid incentive plans to fail. For example, the Wiremold Company of Connecticut concluded after a six-weeks drive that awarding war bonds to employees for perfect attendance was not the solution to the absentee problem. In announcing the discontinuation of the plan the president of the firm stated that the plan had failed to influence the habits of the employees because most of those who had been irregular in attendance before the award system was inaugurated were still irregular.

A recent bus slowdown in New York City was attributed by the third vice-president of the drivers' union to the drivers' refusal to work overtime. He said that the men were not seeking more money; they were tired and they thought the company should hire additional drivers. Their average earnings were $3200 a year, an income which, according to most standards, cannot be considered very great.

Ever since Taylor's time, the "experts" have been concocting one wage incentive system after another, until now there are literally hundreds of such systems. One of the most comprehensive reviews of wage incentive plans is that offered by Charles W. Lytle (*6*), who believes that such plans are important in any cost production problem. According to him, incentive payments have two advantages: (1) an increase in production per unit and (2) an increase in employee earnings. He believes that the advantages of a properly selected, well-installed, and ably managed wage payment plan accrue annually to employees and employers. Of course, Lytle does not say that these advantages "accrue mutually and fairly," for they do not. As Mark Spade says in his brilliant book, *How to Run a Bassoon Factory,* wage incentive systems are a "means of paying employees more—but not so much."

From the point of view of the industrial psychologist, it is extremely difficult to differentiate among the various financial incentive systems. In some respects the only essential difference is who obtains the consulting fee. Lytle has attempted to classify all financial incentive plans on the basis of production-earning characteristics. His results presented in Table 18, give an idea of the numerous systems that have been promoted.

Lytle suggests that certain plans should be used only under certain conditions. He briefly describes the plans and their use as follows:

Plans Which Are Justified, for What, Why and How.

1. Day Rate Plan with production records and promotion.
   For unstandardized work, permanent, or temporary.
   It is simple and about all that can be used.

TABLE 18. Classification of Financial Incentive Plans by Production-Earning Characteristics[1]

A definite quality, quantity standard must be established and enforced as a prerequisite to any of these plans except I-1.

Class I. *Employer Takes All Gain or Loss*

1. Time: hour, week, or any straight salary rate. Not an extra-financial incentive.
2. Standard time using two rates, one either side of task. A two-zone multiple time plan.
3. Multiple time: artithmetic steps in rate between production zones. (Sometimes called standard time plan.)
4. Multiple time: geometric steps in rate between production zones.

Class II. *Employee Takes All Gain or Loss*

5. Piece or straight commission rate. This subdivides into punitive, basic, and high.
6. Taylor (Multiple piece rate or multiple commission).
7. Merrick (Multiple piece rate or multiple commission).
8. Gantt (Combination of No. 1 and No. 5 with step between). (Without step, it would be called piece rate with guarantee, Manchester, Standard Hour, 100% Premium or Haynes Manit. All five have identical earning curves.)

Class III. *Gain Shared Between Employer and Employee but Day Wage Guaranteed, excepting in Barth and "One-Third Premium" Form of Halsey*

9. Halsey.
10. Diemer.
11. Baum.
12. Bedaux, Dyer, Keays-Weaver, K.I.M., Shanley, and Stevens.
13. Ficker Time } (Awkward and unsound).
14. Ficker Piece }
15. Sherman Individual-Group (Awkward and unsound).
16. Rowan, Mansfield, and Bayle.
17. Barth (Particularly good for beginners).

Class IV. *Empiric Location of Points Between the Two Variables*

18. Emerson.
19. Wennerlund (Piece work or commission above 100% production).
20. Knoeppel.
21. Bigelow.
22. Bigelow-Knoeppel.
23. Parkhurst.
24. Ernst and Ernst.
25. Sylvester.

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[1] From C. W. Lytle, *Wage Incentive Methods*, revised printing, copyright 1938, The Ronald Press Company.

Management should eliminate unsupported time payment wherever and whenever possible.

2. Multiple Time Plan with high bonus steps.
   For upgrading employees formerly on day rates, also for group applications.
   It is strong at task point and simple at all points.
   It must be more carefully managed than a more elaborate plan.
3. High Piece Rate Plan—with or without a minimum guarantee, and with the time basis of computation.
   For repetition work, not involving expensive machine rates.
   It is the simplest and the most sound of all the plans.
   Equalization requires care as task per unit of time may not be evident.
4. Merrick Multiple Piece Rate Plan.
   For upgrading inefficient employees formerly on low piece rate.
   It is flexible, strong, and relatively simple for what it can do.
   Tables must be used for explanation and computation.
5. Gantt Task and Bonus Plan (a combination of Nos. 1 and 3 with step between).
   For machine jobs liable to delay and where machine rates are high.
   It provides security with strength.
   The day guarantee may need watching.
6. Halsey (50–50) Constant Sharing Plan with Time Guarantee.
   For guessed-at-standards, no big machine rates.
   It gives a high wage through intermediate production efficiencies.
   Task or rate inaccuracy is less serious.
7. Halsey (40–60) Constant Sharing Without Time Guarantee—up to 70 or 75% of high task.
   For beginners, skilled work.
   It compromises for low efficiencies.
   It is simple to understand.
   This plan is not recommended above task.

8. Bedaux Point Plan.
    For strongly centralized management and for widely diversified operations.
    It gets results through its production control rather than through improved operations and high rates.
    It involves a lot of figuring.
9. Barth Variable Sharing Plan—up to day wages only.
    For beginners, unskilled work.
    It gives a high wage for low production efficiencies without any guarantee.
    Tables must be used, the new employee may not have a slide rule.
    This plan is not recommended above task.
10. Emerson Empiric Scale Plan—between 70 and 100% task only.
    For gradual transition from day work plan to high piece rate plan.
    It avoids the abrupt step and may be justified in some cases.
    The empiric principle is only used within the above limits, and outside of these, other plans are preferable.

As to the other fifteen plans, given subsequently in detail, none of them have inherent merit not to be found in the above, except perhaps the 15-class gradation of Parkhurst.[2]

The financial incentive systems have been overplayed. They do not work as effectively as they are assumed to. The Bank Wiring Observation Room experiment in the Hawthorne plant showed clearly that restricted rather than unlimited production characterized the workers. In his book, *Salary and Wage Administration* (*5*), Ralph W. Ells says: "Fortunately for both management and labor more and more companies are discouraging plans based on fixed standards in favor of plans based on competition between employees or groups of employees. It is only a question of time before all incentive programs will provide real incentives and will keep employees striving to improve." After drawing a sound case for incentives based on group cooperation, he concludes: "If more companies would establish a sound salary and wage structure and adopt an annual program for distribution of abnormal profits there would be fewer personal failures, fewer problems for executives and a better distribution of salaries and wages."

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[2] *Ibid*

The present author believes, as has already been brought out, that not only has the financial incentive plan been overdone, but further, that in many cases the financial award has not even operated as an incentive. There is no doubt that employees and employers need money, if for no other reason than that it is the recognized medium of exchange. However, just how much a person needs is a subject for much speculation. Money is a necessary thing, but only in some instances does it operate as an incentive. Some people can just get along on $2500 a year, others on $5000, and still others on $10,000. Although the low-income group does not appreciate the financial problems of the high-income group, both have such problems, problems that from their respective points of view are of the greatest intensity to both groups. It is not a question of which is right or wrong. Money is needed for food, clothing, shelter, medical care, education, luxuries, social position, and power. Even when people desire money out of proportion to the amounts specifically desired by others, the existence of their need cannot be denied. The power drive, and the belief that money is a source of power, can be just as real a need to one person as the need for money to obtain food is to others. Furthermore, the amount needed for food varies according to size of family, living habits, etc. We cannot talk of the need for subsistence on an absolute basis because too many variables are involved.

The term incentive is used for a spurring force that is introduced as a means of achieving a goal. An incentive bolsters activity in the direction of the goal. An individual may introduce his own incentives, in which case they are extremely meaningful. However, in industry, the incentive is often used as a means of spurring on an employee toward someone else's goal. He may not be interested in either reduced costs or increased production but he may be persuaded to achieve this goal by an incentive. When the incentive results in satisfaction for the employee, and the achievement of the goal results in equal satisfaction for the employer, the plant is being successfully operated. The major difficulty with financial incentives has been the fact that the additional money has not meant as much to the employee as the employer assumed it would. The outstanding reason for employee objections to such plans has been the fear of a rate cut. This fear is present, regardless of whether it is justified or not. In addition to this fear, there is also the fear of a layoff; and so the worker does not respond to the magic of a financial incentive to the extent that the Gantts, Merricks, Emersons, Diemers, Barths, and many of its other proponents would have us believe.

KINDS OF INCENTIVES

INCENTIVES may be classified "financial" and "non-financial," but it seems more desirable to classify them as "competitive" and "cooperative." In both education and industry, the values of incentives based upon cooperation are beginning to be realized. Organizing people into meaningful groups and having them work together toward a common goal results in more learning at the educational level and greater production at the industrial level. The reports of various companies bear out this statement (see Chapter XIII).

Both competition and cooperation may in themselves be regarded as incentives. Competition calls for one individual to do better than the next individual. Cooperation calls for people to contribute equal and maximum efforts toward a common goal. Competition and cooperation are not mutually exclusive especially when individuals cooperate in groups to compete with other groups. Industry in the past has placed too much emphasis upon competition; only recently have the advantages of cooperative behavior as an incentive been recognized. The use of cooperation as an incentive holds considerable promise of success.

In the mind of the employee a minimum of five drives are likely to operate on the job. In alphabetical order they are: advancement, hours of work, salary, security, and supervisor relationships. A study conducted by Blum and Russ (*1*) attempted to determine the relative importance of these five incentives. The data were obtained from a group of 286 gainfully employed people ranging in age from 17 to 60 years, and in occupation from unskilled manual labor to the professions. There were 181 men, 72 of whom were married, and 105 women, 26 of whom were married. All the subjects lived in the New York City area.

The questionnaire used in the study is shown in Fig. 12.

An examination of it reveals that each of the five incentives is compared with the other four. Actually, this results in ten comparisons. Each time one incentive is preferred to the other in the comparison, a score of 1 is assigned to it; in other words, a maximum of 10 points is distributed among the five incentives. Consider, for example, the following score:

Salary	1
Security	1
Supervisor	1
Hours of work	4
Advancement	3

This score means that the individual checked salary once out of a possible 4 comparisons, advancement three times out of a possible 4 comparisons, etc.

The subjects in this study were told to answer the ques-

Sex..........Age..........Married or single....................

Title of present job..

Circle number applying:

How many jobs have you held?
1 2 3 5 8 10 More than 10

How many years have you been employed?
1 2 3 5 8 10 More than 10

How many years with present employer?
1 2 3 5 8 10 More than 10

How many employees in present firm?
5 10 25 50 100 More than 100

In the following list, please check one item in each pair which you consider more important to you in a job. There is no correct or model answer. Each answer is indicative of your attitude.

.......Receive more pay and have an insecure job, or
.......Receive less pay and have a secure job.

.......Have a friendly supervisor and work more hours, or
.......Have an unfriendly supervisor and work fewer hours.

.......Receive more pay and have no advancement possibilities, or
.......Receive less pay and have advancement possibilities

.......Have a secure job and work more hours, or
.......Have an insecure job and work fewer hours.

.......Have a friendly supervisor and no advancement possibilities, or
.......Have an unfriendly supervisor and have advancement possibilities.

.......Receive more pay and have an unfriendly supervisor, or
.......Receive less pay and have a friendly supervisor.

.......Have a secure job and no advancement possibilities, or
.......Have an insecure job and advancement possibilities.

.......Receive more pay and work more hours, or
.......Receive less pay and work fewer hours.

.......Have a secure job and an unfriendly supervisor, or
.......Have an insecure job and a friendly supervisor.

.......Work fewer hours and have no advancement possibilities, or
.......Work more hours and have advancement possibilities.

Interviewer..................................

FIG. 12. Attitude Questionnaire. (From M. Blum and J. Russ, *1*.)

tionnaire as it applied to their own feelings rather than to any general attitude. The purpose of the questionnaire was not discussed with any subject prior to his completing it.

Although the number of subjects was small, and therefore the interpretations and conclusions may be in error because of the limited sampling, repetitions of this questionnaire have yielded similar results (as yet unpublished). The results of this study are presented not so much to indicate absolute findings as to illustrate the possible uses to which this questionnaire can be put.

The total sample was divided into thirds on the basis of when the completed questionnaires were returned by the interviewers. From Table 19 it appears that not only are the ranks of the various incentives similar but that only slight differences in the averages exist.

TABLE 19. Average Score of First and Third Groups

	Salary	Security	Supervisor	Hours	Advancement
First third	1.64	2.75	1.36	0.82	3.43
Third third	1.76	2.66	1.31	0.82	3.48

The attitude of men and women toward the various incentives is shown in Table 20, as an average score on each incentive for the two groups. In addition, the number of times a particular incentive was preferred is shown as a percentage of the total obtainable for that incentive. An analysis of these figures indicates that the two sexes tend to agree as to the relative importance of the various incentives. The single exception is the women's rating of supervisor ahead of salary; for the men this is reversed. Both groups rate advancement and security in first and second place and agree that hours of work are least important. The men consider advancement and salary much more important as incentives than the women do. But supervisor relationship is more important for the women than for the men. Security and hours of work are not statistically differentiated within these groups.

TABLE 20. Scores and Percentages for Each Sex on the Questionnaire

	Men		Women	
	Score	Per Cent of Total Score Attainable	Score	Per Cent of Total Score Attainable
Salary	1.84	46	1.43	39
Security	2.77	69	2.86	72
Supervisor	1.33	33	1.79	45
Hours of Work	0.59	15	0.86	21
Advancement	3.47	87	3.06	76

A further analysis was made on the basis of marital status, the results of which are shown in Table 21. We find that both the married men and the single men attach approximately the same importance to salary, supervisor, and hours. Security is more important to the married men, and advancement is more important to the single men. The women show no statistically significant differences among the various incentives with the single exception of hours of work; the married women attach greater importance to working fewer hours than do the single women. The married men emphasize security more than the married women do, and security is more important to the single women than to the single men. The married women attach greater importance to the supervisor than do the married men; this difference is seen also in comparing the single men and women. Attitude toward salary is un-

TABLE 21. Attitude Toward Various Incentives According to Marital Status

	Men		Women	
	Married	Single	Married	Single
Salary	46%	46%	34%	36%
Security	76%	65%	65%	73%
Supervisor	32%	34%	51%	45%
Hours of work	13%	16%	29%	18%
Advancement	83%	89%	71%	78%

affected by marriage, a finding similar to that reported by Cole (*3*). The married men care least about the number of hours worked, and the married women care most; no difference is observed between the single men and women. Advancement is more important among the single men than among the married men; this is also true for women.

Inasmuch as attitude toward work may be a product of age, the two groups were separated into the following age categories: less than 20, 20 to 29, and above 30. Table 22, which presents the results of this analysis, indicates that the group over 30 is less interested in advancement than are the younger groups; this is true for both sexes. This group also places greater emphasis on security than do the younger groups, and attaches less importance to the supervisor relationship. The women, as they grow older, are more interested in working fewer hours. It is to be noticed that salary remains relatively constant for both sexes regardless of age.

TABLE 22. Age and Attitude Toward Various Incentives

	Men			Women		
	Less Than 20 Years	20-29 Years	30 Years and Above	Less Than 20 Years	20-29 Years	30 Years and Above
Salary	43%	47%	45%	39%	39%	37%
Security	72%	65%	78%	71%	70%	77%
Supervisor	38%	32%	33%	46%	48%	42%
Hours of Work	10%	17%	13%	17%	20%	27%
Advancement	88%	89%	81%	78%	78%	67%

The data on the number of jobs held and the years employed were analyzed; the results were very similar to those obtained on the basis of age. Naturally, the older a person is, the greater the opportunity for more jobs and longer service with an employer. However, a much larger group of subjects would be required before we could definitely determine whether there actually is this close relationship among jobs held, years employed, and age.

The study also analyzed the attitudes of the two groups in relation to the total number of employees in the firms where they worked. A comparison of the attitudes of people who work for a firm with less than 5 employees and those of individuals in companies with 100 or more employees shows that the latter rate advancement as much more important than do the former. The supervisor is much more important in small firms. The other three incentives are rated alike by both groups.

To summarize, this study measured the attitudes of employees toward five incentives by the paired-comparison technique. It found that advancement and security were the two most important incentives, with hours of work the least important. Salary was rated third by the men and fourth by the women. Supervisor relationship was ranked fourth by the men and third by the women. Married men considered security more important and advancement less important than did the single men. The married women were more interested in working fewer hours than were the single women. The significance of advancement as an incentive decreased with age for both sexes, and security became more important with age, but advancement and security were considered more important than salary. The attitudes of employees changed in relation to such major classifications as sex, marital status, and age.

The views of Harold Ruttenberg (7) are interesting in this connection. Although unions are often believed to have as their single purpose the obtaining of more money for their members, they may satisfy the employee's tremendous need for self-expression. Ruttenberg, who was formerly Research Director of the Steel Workers Organizing Committee and is now an executive in a large steel company, emphasizes this need when he says: "The urge for a means of self-expression is usually present in every individual in an industrial plant, and consciously or unconsciously (usually the latter) each individual constantly seeks some way to express himself." In his experience in industry, he has found the need for self-expression to be a basic incentive, as important as the desire for economic betterment and personal security, and in some instances even more important.

WHY PEOPLE WORK

LIFE, whatever it is, can be characterized as activity, and during the course of it people are continually active, even when they sleep (everyone turns and moves during a normal night's sleep). Work is a form of activity that has social approval and satisfies a real need of the individual to be active. To produce, to create, to gain respect, to acquire prestige, and incidentally to earn money—these are some of the reasons why people work.

In our society there are few instances of forced idleness; but when they occur, they are usually characterized by unpleasantness. People in jails or hospitals and the unemployed are examples of forced idleness. Almost everyone in jail wants to get out; even the hospital patients who have all their wants attended to and who receive tremendous attention from attractive nurses, besides their family's overabundant concern, still yearn to get back on the job. Similarly, the average worker waits an entire year for his two-week vacation and plans how he will do nothing but rest. In some cases the vacation results in a need for a real vacation, but the employee handles this somehow when he is back on the job—within a month he is making plans for resting up on his next vacation.

In 1935 Sidney Roslow conducted a survey on the attitude of 98 relief workers toward work relief or home relief. Although the money received by these two groups of people on relief differed, by no stretch of imagination could either be regarded as financially affluent. Everyone in the entire group preferred work relief to home relief because it allowed them to maintain their self-respect. Only 3 per cent based their preference on the fact that work relief paid more; 43 per cent preferred it because of the effect it had on their morale, and 50 per cent preferred it because they were paid for working or they preferred working to being idle.

Many theories have been advanced to explain work. The Gilbreths believed that work could be made pleasant. Henry Ford, on the other hand, believed that it was basically unpleasant and that therefore the hours of work should be as short as possible and the pay as high as possible.

The author has been successful in stumping his classes over a period of years by requesting them to differentiate between work and play. Is a major league baseball player, or a man who plays this game on his only day off, working or playing? Is a business executive entertaining an important customer at a nightclub at work or at play? Is an amateur fisherman who gets up at 3 A.M. to go fishing at work or at play?

Nor does an attempt to differentiate between work and play on a monetary or voluntary basis help. Is the volunteer nurse at work or at play? Forced or required activity for which one does not receive pay may be work, but it also may be play. When a psychologist mows the lawn under a hot sun because the lawn needs attention, he is a gardener; but is it fair to say that the gardener and the psychologist are both working? Of course there are differences between work and play, but in many instances the only difference is in the attitude toward the activity or the label attached to it.

We must recognize the important values which are attached to the many needs expressed and achieved in work. Mastery of the job and the importance of self-expression are two such values. The Studebaker Company's advertising plays up the individual pride and sense of responsibility in its workers, and proves the point by means of father-and-son teams, like that shown in Fig. 13. Along the same line, is this little story told by Bob Burns:

Fig 13 Pride and Responsibility in Work (By permission of The Studebaker Corporation)

If you want a job done well, give it to a man that takes pride in his work. You may have to wait a little longer for it, but when you get it, it'll be done right. We've got an old tailor down home that has the reputation of being the best pants maker in seven counties, but you can't rush him.

A traveling man heard of his reputation one time, and while he was in town he ordered a pair of pants from this old tailor. The salesman left town and came back in two weeks and called up the tailor and the tailor says, "Your pants ain't done yet but I'm workin' on 'em." A month later the salesman came back to town and his pants wasn't ready yet.

Finally on his fourth trip he dropped around to the tailor's shop and found the old tailor had just finished the last stitch. The salesman was pretty mad. He turned to the tailor and he says, "It took six days to make the world and it took you eighty days to make these pants!" The old tailor said, "Yes, but just take a look at the world and then take a look at them pants!"

Few people are able to continue a job that they regard as meaningless or that they really know they cannot do well. Near a certain station of a railroad there is a gatetender whose job is to lower the gates when trains pass his station. It is with considerable pride that this man, day in and day out, lowers the gates and then stands where he can see the engineer. His behavior is so routinized that in many respects it is compulsive. When a train is a certain distance away he starts to wave with a large circular motion, and the expression on his face changes from pleasure to delight and finally to sheer ecstasy. When the engineer comes alongside him his hand is upraised and his face is beaming; anyone can see that this man enjoys his job. Apparently the engineers enjoy his antics too, because they toot their whistles out of all proportion to safety needs; each one responds to the greeting in his own way. This man is very different from most gatetenders who regard each passing train as an interference with peaceful slumber, and each engineer as a nuisance.

Tell the man who is polishing automobiles or drawing intricate plans for a house that he has done an excellent job and he will find reward in his work. Mastery of the job and pride in successful accomplishment are real reasons why people work and work hard. This applies to all jobs that are recognized as jobs, regardless of where they stand in the social hierarchy. The bus boy hopes some day to be a waiter; therefore he likes to work with a waiter who will give him a chance to learn. The plumber's helper wants to be a master plumber, and the college instructor wants to be a full professor.

Although there are few case studies of the average, typical, normal worker, the few that have been made indicate that the financial incentive does not play an overwhelming role in a man's working life. Prestige, social acceptance, pride in work, self-expression, and the many related social drives are all equally or even more meaningful. An interesting book entitled *Seven Shifts,* edited by Jack Common (*4*), describes the life and work history of seven ordinary Englishmen: a plasterer, a steel worker, an unemployed man, a gas worker, a market man, a blast furnace man, and a railroad worker. To read these industrial autobiographies of average-typical-menial-marginal workers is to become convinced that money is not the most important incentive to a worker. A workingman does not separate his living from his working life. He is a human being embodying many motives and conflicts, and his behavior is as unpredictable on the job as it is in life. These seven people have written autobiographies emphasizing their work experiences and attitudes. Although each story is very different from the others, all have a common core in that they describe part of that large group of people known as employees. Wisely enough, no attempt has been made to type workers on the basis of these seven autobiographies.

Jack Hilton, the plasterer, is a man who takes great pride in his work. As he puts it, "Plastering is essentially human and it makes its tradesmen human. Our material comes from Mother Earth and we use it with skill and muscle. Relative to men on other occupations we may appear primitive. That is our good fortune. . . . We get the satisfaction that we have really done something; something that a machine hasn't done; something that has called for greater patience, ingenuity and skill than a four-minute job."

According to Hilton, the plasterer is proud of his long trade union history. He is proud of doing a job well, is skillful, and knows how to be adaptable. Furthermore, his work, his employers, and his fellow employees give him variety. A job usually lasts from six to ten weeks, and when it is unpleasant he has the consolation of knowing it will not last long.

In speaking of his work's disadvantages, Hilton mentions the time lost because of slack periods and bad weather. He also dislikes the long and costly trips to and from a job. The common menace faced by all plasterers is the lime in the materials which sometimes gets into the eyes.

The plasterer has a higher status than the laborer and he shows this superiority in many ways. With respect to the plasterer's relation to the guffer (boss), Hilton writes, "I can work harder for a guffer that is a decent sort and leaves the job to me than for one who is never satisfied and is always coming around trying to pull a bit more out of me." At times the men will compete vigorously with one another and work at a terrific pace. They shout "Stuff, stuff, stuff" and use it up as fast as the laborers can bring it. Finally one of the men will capitulate, whereupon they return to a more normal work pace in which they do not try to "murder themselves."

Hilton is not necessarily a typical plasterer, but he is typical of a man who is proud of his work.

James Stirling is a very different person. He had a job in a steel mill and was preoccupied with the dangers in the rollers and other machinery in the mill. He had a strong dislike for the fumes, dirt, and primitive work conditions. Finally thrown out of work because of a slack, he held a series of jobs, such as knocking bricks from a kiln, working with a barrow, operating a crane, and doing clerical work.

Stirling is rather bitter about the depression and its effect, and also about management experts. He writes, "Trainees drift through large workshops in two years or so, spending a month here, six weeks there, going over every department, learning 'workshop control,' developing themselves to be managers sometime in the future. They are probably decent lads, but they don't know a damn thing when it is all over that this or that scrub worker at fifty shillings a week cannot do with his eyes shut and without thinking."

Will Oxley, the unemployed man, tells a vivid and lurid story of what goes on inside a man when he has no work over a long period.

Herbert Mannion has a job in a "gas works" but apparently his basic motive is the desire for drink; work is merely an interlude between consuming a pint or so. He is pessimistic and somewhat fatalistic about his work: "So it goes on—until a slump sends me to the dole and the Means Test, accident to the hospital or early old age dumps me on the scrap-heap. Whichever of these finishes my working career, I shall end up with nothing in the bank and not so much as a thank you from the people who have profited by my labour. You all come into the world with nothing and you can't take anything out. Well, that's a working lad's life, anyway."

Simon Blumenfeld, who operates a stall in a market, is aware of the ills suffered by minority groups. He tells about the practical jokes that are played on these people and their ways of adjusting to the situation. He is aware of the "social and racial groupings" that gravitate to certain occupations as the line of least resistance. He does not consider the life of a small trader a happy one. According to him, "If the small trader could be profitably absorbed in industry, this would probably be a good thing for everyone concerned. He works longer hours than most of our craft unions would allow, and becoming more and more the rule, draws less money than the lowly salaried worker at the end of the week." He must hang on because, even if he was once a craftsman, he cannot go back to his trade and a job as a shop assistant is closed to him because these positions are usually filled by young people.

J. H. Watson, who works in a blast furnace, is a "strong and cursing man" who has little respect for anyone who does not sweat while he works. In describing the process that leads finally to the tapping of the molten iron, he writes, "No doubt this sounds very dull but I can assure those people who have never seen a blast furnace, that I have worked on one for a dozen years and assisted at two or more tappings a shift, and I still get a feeling of awe, sometimes a mood of exhilaration, when we tap." He is dissatisfied with his inadequate and primitive living quarters and is concerned about the many evil manifestations of the power of money. He believes that the man who lives next to a cesspool is more precious than the man who condemns him to live there. He considers the laborer an outcast who smells a bit, but he regards the remainder of society as dependent upon his existence.

T. A. McCullock, a fireman on a railroad, counts himself one of the lucky ones because he has had no unemployment, receives steady pay, and each year is given three free passes for travel. He admits that he gets tired of the monotonous regularity of railway work but he still believes the day he applied for the job was a lucky one.

He is most concerned with what the other workers think. Warnings and fines hurt because their recipient feels that his prestige among his fellow workers is lowered. As McCullock says, "The worker always has his pride in being equal to his job. The company, of course, is just his natural enemy. He could evade the company's watch on him and be comfortably inefficient. But he can't escape his mate's opinion of him. His mates don't object to him drinking while on duty; they don't care if he steals from the company. Damn good workers do both."

McCullock is critical of leadership but believes that it does no good to blame it because the self-styled leaders have no clear mandate. He thinks that the general view of employees is that the dumber they are, the better, and that brains and imagination are discouraged. "Most of the time we'd be content to let the self-styled clever folk carry on, provided they left us a loop hole to be free in. For it's a big job to be responsible for, and we know too much about jobs in general to rush at one before we have some idea of how it should be done."

These seven ordinary working-class men are just as human as everyone else. They differ in their jobs and their motives and their way of life. None of them believe that they are dumb; they are critical, sometimes even contemptuous, of those who "run the show." They do not really want to take over the functions of these others, but they do want a chance for self-expression and they feel a crying need to be understood.

The case study approach to the problem of the motivation of people in industry can lead to productive results and better understanding. Although efficiency systems often assume that there are short cuts in motivating people, there are none that are worth while.

This chapter may be somewhat disappointing to those who believe that the psychologist should know all about motivation and hence should be able to explain motives and predict behavior. In many respects, one of the great differences between the psychologist and the layman is that the psychologist is much more reluctant to make predictions about behavior.

SUMMARY

Motivation is usually a complex process. An individual's drives are determined in part by certain physiological imbalances within him, in part by his previous experiences, and in part by the interaction of these two. Industry has tended to oversimplify the worker's motives by attaching too much importance to financial incentives. Many systems of incentive wage payments have been proposed. They overlap in many ways, and all of them are faulty because they exclude the many other motives that operate in man while he is at work, and they refuse to recognize that incentive systems themselves tend to cause fear of rate cutting or dismissal in his mind. A study that attempted to discover the relative value of five common incentives on a job found differences based on sex, age, and marital status, but never found that salary was the most important of the incentives. Recent research indicates the value of cooperative incentives. The common goal of a united group can be a more powerful incentive than that of a number of people competing with one another for individual goals which, in the final analysis, they believe to be of little worth. People work because of pride in successful accomplishment, mastery of the job, and other equally potent social pressures. In many instances work is not as dissimilar to play as is ordinarily presumed. Of value in understanding motives as they operate on the job are biographical sketches and case histories, for they enable a keener insight into the motives at work in people in industry. Such studies are more valuable than the assumptions of the industrial engineer or "expert" who believes that people work only for money.

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7. Job Analysis

A JOB analysis is an accurate study of the various components of a job. It is concerned not only with an analysis of the duties and conditions of work, but also with the individual qualifications of the worker. Whereas the industrial engineer is concerned primarily with the job aspects, the industrial psychologist emphasizes the man aspects of the job.

Although it is true that different meanings are assigned to the terms job analysis, job specification, and job evaluation, for the practical purposes of the industrial psychologist these terms may be regarded as relatively similar.

USES AND VALUE OF JOB ANALYSIS

LAWSHE AND SATTER *(6)* propose four major uses of job analysis: the derivation of training content, the setting up of personnel specifications, the improvement of job efficiency, and the establishment of wage structures.

After an intensive survey of 401 articles in the literature on job analysis, Zerga *(13)* concludes that there are approximately twenty uses for this type of information. He mentions the following specific uses:

1. Job grading and classification.
2. Wage setting and standardization.
3. Provision of hiring specifications.
4. Clarification of job duties and responsibilities.
5. Transfers and promotions.
6. Adjustment of grievances.

7. Establishment of a common understanding between various levels of workers and management.
8. Defining and outlining promotional steps.
9. Investigating accidents.
10. Indicating faulty work procedures or duplication of effort.
11. Maintaining, operating, and adjusting machinery.
12. Time and motion studies.
13. Defining limits of authority.
14. Indicating cases of individual merit.
15. Indicating causes of personal failure.
16. Education and training.
17. Facilitating job placement.
18. Studies of health and fatigue.
19. Scientific guidance.
20. Determining jobs suitable for occupational therapy.

A careful examination of this list shows the great importance of having a job analysis made. Furthermore, this technique should not be regarded as being suitable only for large organizations. A good job analysis can be very important in easing much of the friction that often arises in the typical small office employing only a few girls. It is not unusual to find that in such an office the girls continually quarrel as to whose job it is to get the bills ready for mailing; everyone insists that she was not hired for that job and she sees no reason why it should fall on her. A frequent solution is to have the girls take turns, but this hardly ever helps because the girl who has to do this work on a particular day will accuse the other girls of refusing to help her. However, if there were clear-cut statements of specific requirements for the various jobs, such as a job analysis provides, much of this friction would be eliminated.

Another source of friction in offices is the lack of definite limits of authority. Thus a girl with seniority, even if it is only two weeks old, will attempt to assume authority over a new employee; the latter soon discovers that she has far too many bosses. Here again a job analysis is valuable.

In many respects, a job analysis is a vital part of working efficiency, besides promoting smooth working relationships among the employees. It can be regarded as the foundation upon which a system of efficiency is built. Effective training programs, good personnel policies, attempts to reduce fatigue, and many other measures leading to efficiency cannot be introduced effectively unless the basic and preliminary step of job analysis has been taken. Prior to the development of psychological tests for industrial use, a job analysis must be made.

FORMS OF JOB ANALYSES

DIFFERENT methods are used to obtain the data for a job analysis. In one method the job analyst observes the employee performing the job and writes up the results in any one of the acceptable forms. In another method the job analyst performs the operation himself and bases his written report on his analysis of his own activities. In a third method the job analyst interviews the worker in order to obtain the necessary information. In the fourth method photographic aids, such as stills and motion pictures, are used.

The best results in making a job analysis are usually obtained with combination of various parts of all the methods just mentioned. The form used by the United States Employment Service, which incidentally has done a great deal of valuable work in this field, is presented in Fig. 14.

A somewhat different form is suggested by Viteles' Guide to Job Analysis (*11*) which lists the following eleven items:

1. Identification of the job.
2. Number employed.

1. Job title. 2. Date. 3. Alternate job titles. 4. Establishment No. 5. Industry. 6. Branch. 7. Department.

A. MINIMUM QUALIFICATIONS FOR EMPLOYMENT.

1. Sex. 2. Age. 3. Height. 4. Weight. 5. Education: S R W English; Other. 6. Special knowledge required: (*a*) None; (*b*) Specify. 7. Experience: (*a*) None; (*b*) Same job; (*c*) Recentness; (*d*) RNP; and (*e*) Similar job; (*f*) Title; (*g*) Recentness; (*h*) RNP; or (*i*) Similar job; (*j*) Title; (*k*) Recentness; (*l*) RNP; (*m*) Other job; (*n*) Title; (*o*) Recentness; (*p*) RNP. 8. Comments.

B. RELATION OF THIS JOB TO OTHER JOBS.

1. From what jobs are workers promoted to this job? 2. To what jobs (not involving promotion or demotion) may workers on this job be transferred? 3. To what jobs are workers on this job promoted? 4. Into what jobs is this job broken down in other establishments? 5. With what jobs is this job combined in other establishments? 6. Comments.

C. DETAILS OF JOB.

1. Seasonality of job: (*a*) Not seasonal; (*b*) Seasonal periods. 2. Machine set-up: (*a*) Done by worker; (*b*) Done by others. 3. Personal tools and equipment required: (*a*) None; (*b*) Specify. 4. Accuracy required: (*a*) Coarse; (*b*) Fine; (*c*) Exact. 5. Knowledge of special measuring devices: (*a*) No; (*b*) Name and use. 6. Knowledge of graphic instructions: (*a*) No; (*b*) Name and use. 7. Average production. 8. Comments. 9. In the opinion of management, what elements of this job require most skill from the worker? 10. Name of machine. 11. Maker. 12. Size or capacity. 13. Type. 14. Special attachments: (*a*) None; (*b*) Name and use. 15. Positions and activities: (*a*) Stand; (*b*) Sit; (*c*) Stoop; (*d*) Reach; (*e*) Walk; (*f*) Climb; (*g*) Lift; (*h*) Pull; (*i*) Push; (*j*) Other. 16. Transportation of materials: (*a*) None; (*b*) Hand; (*c*) Truck. 17. Strength needed most: (*a*) Back; (*b*) Legs; (*c*) Arms; (*d*) Fingers. 18. Surroundings: (*a*) Inside; (*b*) Outside; (*c*) Hot; (*d*) Cold; (*e*) Humid; (*f*) Dry; (*g*) Wet; (*h*) Noisy; (*i*) Dirty; (*j*) Dusty; (*k*) Oils; (*l*) Acids; (*m*) Fumes. 19. Hazards: (*a*) None; (*b*) Electrical; (*c*) Explosions; (*d*) Acids; (*e*) Poisons; (*f*) Falls; (*g*) Heat or burns; (*h*) Mechanical; (*i*) Specify. 20. Team Work: (*a*) No; (*b*) With whom. 21. Pacing: (*a*) Sets own pace; (*b*) Paced by machine; (*c*) Paced by management. 22. Supervision given: (*a*) General; (*b*) Close; (*c*) Inspection. 23. Supervision given: (*a*) None; (*b*) Number supervised; (*c*) Titles. 24. Contacts with public: (*a*) None; (*b*) Describe. 25. Comments.

D. JOB ELEMENTS.

FIG. 14. Headings in the Job Analysis Form Used by the United States Employment Service.

3. Statement of duties.
4. Machines used.
5. Analysis of operations.
6. Conditions of work.
7. Pay and non-financial incentives.
8. Relation to other allied jobs. (Place in the organization.)
9. Opportunities for transfer and promotion.
10. Time and nature of training.
11. Personal requirements:
    a. General, (e.g.) age, sex, nationality, marital status.
    b. Physical.
    c. Educational.
    d. Previous experience.
    e. General and special abilities.
    f. Temperamental and character requirements.

Another form includes the following major divisions:

1. Job name or title.
2. Classification title.
3. Industry, plant, department, division, section.
4. Number employed.
5. Hires, quits, job absences.
6. Work performed.
7. Supervision given and received.
8. Level of difficulty.
    a. Initiative.
    b. Mental alertness.
    c. Judgment.
    d. Responsibility.
    e. Knowledge.
    f. Dexterity.
    g. Accuracy.
    h. Experience and education required.
    i. Other factors.
9. Pay rate.
10. Hours and shifts.
11. Output standards.
12. Job combinations or breakdown.
13. Job relationship.
14. Machines, tools, equipment, material used.
15. Working conditions.
16. Physical demands.
17. Worker characteristics.

18. Previous experience required.
19. Training required.
    a. General level.
    b. Vocational training.
    c. Technical training.
    d. On-the-job training.
20. Selection methods.[1]

A comparison of these three outlines for a job analysis shows considerable overlapping. The point here is that for any organization the specific items to be included in the study may vary. The decision as to which type to use, or the development of a new form that will more readily conform to the needs of a particular company, will depend primarily on which of the many potential uses of a job analysis is considered the most important.

Industry is often concerned with making job evaluations rather than job analyses. The essential difference between these two is that job evaluation has as its function the establishment of equitable wage and salary rates. Job evaluations may be obtained by ranking one job, as a whole, against another job or by classifying jobs according to previously determined standards. These methods attempt to evaluate the job as a whole. The more common approach, however, is to evaluate job against job by breaking each into its elements. A rating system is usually used, such as that devised by Kress (*5*). In this system there are four major items and each item has subdivisions. Job evaluation is achieved by assigning one of five ranks to each of these items. Each job is rated for:

1. Skill:
    a. Education.
    b. Experience.
    c. Initiative and ingenuity.
2. Effort:
    a. Psychological demand.

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[1] From Carroll L. Shartle, *Occupational Information*. Copyright, 1946, by Prentice-Hall, Inc.

    b. Mental or physical demand.
3. Responsibility:
    a. For equipment or process.
    b. For material or product.
    c. For safety of others.
    d. For work of others.
4. Job conditions:
    a. Working conditions.
    b. Unavoidable hazards.

Points are assigned to each of the subitems and the total points for a job are then transferred to the many values which establish the wage for that job.

TWO PSYCHOLOGICAL CONTRIBUTIONS TO JOB ANALYSIS

As MENTIONED previously, the psychologist's interest in job analysis is the man aspect of the job, and two contributions along these lines have been Viteles' job psychograph (*11*) and the occupational ability pattern devised by the Employment Stabilization Research Institute of the University of Minnesota.

Viteles' job psychograph consists of a complete statement of the personnel requirements for a job. Theoretically it involves an analysis and specification of special abilities necessary for success. A uniform list of traits is presented and each trait is rated on a five-point scale in accordance with its degree of importance for the specific job.

The job psychograph presents certain difficulties. For example, each trait listed requires specific definition. A major although surmountable difficulty in using this technique is that the person doing the rating must be trained in the understanding and knowledge of the specific traits. Furthermore, up to the present time, psychologists have not been able to develop, to their complete satisfaction, valid measures of many of the traits listed. Proficiency, alertness, and initiative are a few examples. However, the job psychograph has its use in industry and in many respects embodies no more errors than Kress's rating system.

A job psychograph for a power machine operator is shown in Fig. 15 (7).

	1	2	3	4	5	Remarks
1. Energy		X				
2. Rate of discharge			X			
3. Endurance		X				
4. Control	X					
5. Coordination A				X		
6. Coordination B					X	
7. Initiative		X				
8. Concentration			X			
9. Distribution (of attention)			X			
10. Persistence			X			
11. Alertness		X				
12. Associability		X				
13. Visual discrimination				X		
14. Auditory discrimination	X					
15. Tactual discrimination	X					
16. Kinesthetic discrimination			X			
17. Space perception				X		
18. Form perception		X				
19. Accuracy			X			
20. Visual memory		X				
21. Auditory memory	X					
22. Kinesthetic memory		X				
23. Understanding		X				
24. Understanding (quickness)	X					
25. Observation			X			
26. Planfulness		X				
27. Intelligence	X					
28. Intellect	X					
29. Judgment	X					
30. Logical analysis	X					
31. Language ability	X					
32. Executive ability	X					

Key:
1. Negligible.
2. Barely significant.
3. Significant.
4. Of great importance.
5. Of utmost importance.

FIG. 15. Job Psychograph of a Power Machine Operator. (From J. J. Otis and K. R. Smith, 7.)

Another example of a job psychograph is shown in Fig. 16. A comparison of these two psychographs shows some differences in the traits involved.

DEPARTMENT:	Division: Auditing				
Accounting	1	2	3	4	5
Rate of discharge					XX
Coordination A				X	
Initiative		X			
Concentration		X			
Distribution of attention				X	
Persistence				X	
Alertness		X			
Auditory discrimination	X				
Tactile discrimination	X				
Space perception	X				
Form perception	X				
Accuracy					XX
Visual memory				X	
Auditory memory	X				
Kinesthetic memory		X			
Understanding		X			
Understanding (quickness)	X				
Observation					XX
Planfulness		X			
Intelligence	X				
Judgment	X				
Logical analysis	X				
Language ability	X				
Executive ability	X				

FIG. 16. Job Psychograph of an Auditor. (Figs. 16, 17, and 18 from B. J. Dvorak, *Differential Occupational Ability Patterns*, copyright, 1935, University of Minnesota Press.)

There is an important implication for vocational guidance and selection in the job psychograph, and that is the fact that a person without experience in a specific job can be rated for the possession of the various traits and the resulting profile matched with the profile for a specific job. When there is a resemblance, job and applicant can be brought together.

Paterson, Dvorak, and others connected with the Employment Stabilization Research Institute of the University of Minnesota, where the occupational ability pattern was devised, were interested in carrying the job analysis technique one step further. They assumed that abilities on a job can be measured by a representative sampling of psychological tests and, further, that the battery, or collection of tests, was such a sampling. With these assumptions they gave a battery of tests to groups of individuals who were successful in specific occupations and obtained scores and profiles of the most typical test performances of people on the job. The occupational ability pattern thus attempts to avoid trait specifications such as Viteles proposes, and it also tries to avoid evaluative and subjective opinions, even though they are obtained from experts. The tests attempt to sample the abilities and aptitudes of the individual on a rather wide range and cover such material as verbal intelligence, finger dexterity, spatial relations, and eye-hand coordination. Since this chapter is primarily concerned with job analysis, a more complete discussion of psychological tests will be postponed until Chapter 16.

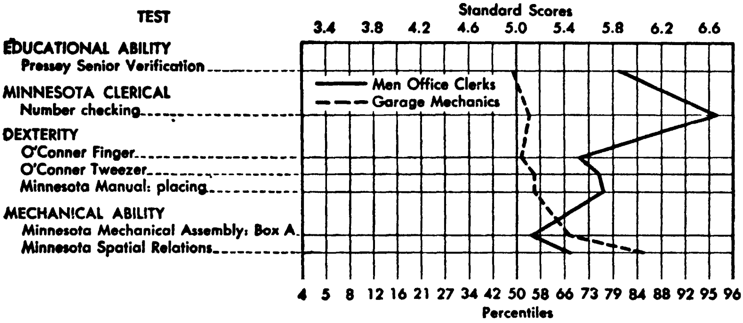

FIG. 17. Various Occupational Ability Patterns.

Here there is an even more obvious relationship between this technique and vocational guidance and selection than there was with the job psychograph. A person can be given the battery of tests and his profile then compared with the profile typical of various occupations. He can then be

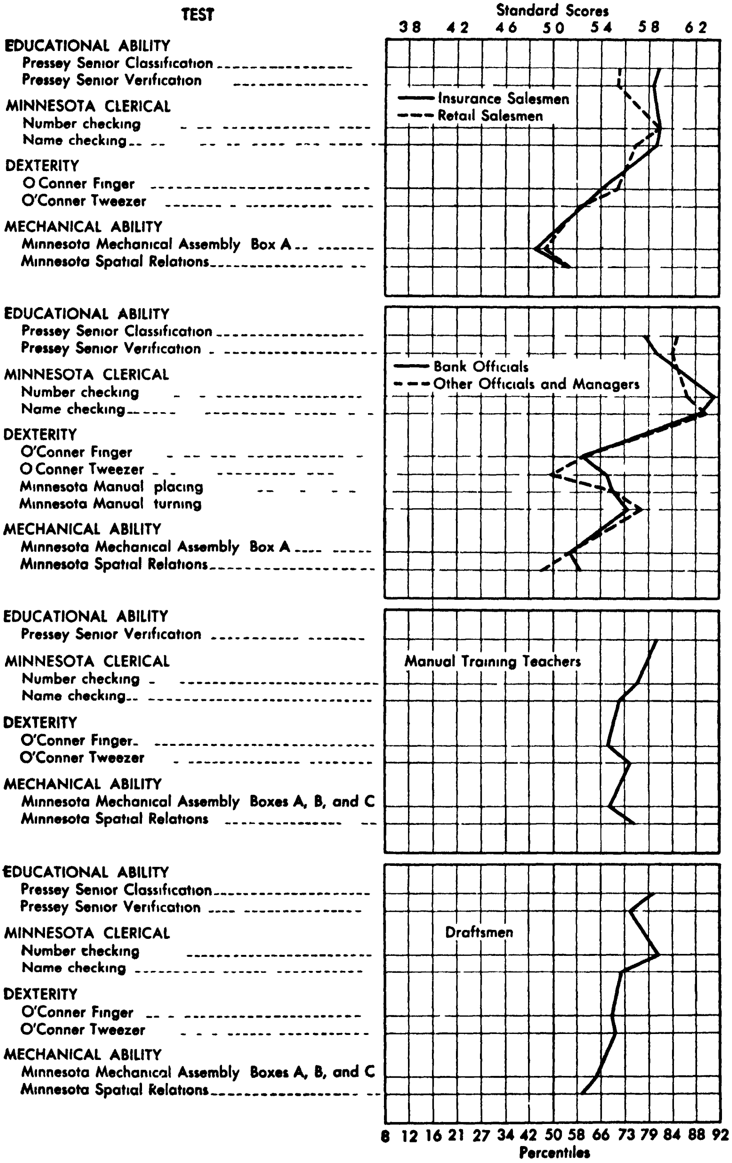

FIG. 18. Various Occupational Ability Patterns.

given the job whose profile has the greatest resemblance to his own. Sample occupational ability patterns are presented in Figs. 17 and 18.

OCCUPATIONAL INFORMATION

As A result of the many job analyses that have been made in many industries, a huge body of knowledge known as "occupational information" has accumulated.

One of the very valuable contributions of the United States Employment Service has been the preparation of the *Dictionary of Occupational Titles* containing definitions of 21,643 occupations. This publication, the only thorough one of its kind, is useful not only in employment offices in industry but in vocational guidance and related fields. Robert C. Goodwin (*4*), director of the Service, has described it as a compilation of all the different jobs in the economy:

> The dictionary describes each of these jobs and outlines the minimum qualifications for filling them. It shows the relationship of one kind of job to other kinds of jobs so that if a worker cannot locate a job in his particular skill, local employment personnel, by using this dictionary, can find out what other types of work his qualifications fit him for and thus refer him to a job. The dictionary is a standard work that is widely used by industry, by other Government agencies, libraries, and the Employment Service offices in the various States. All of the States use this as basic material for classifying orders from employers and selecting people to fill jobs.

The *Dictionary* consists of four parts: Part I, "Definition of Titles"; Part II, "Group Arrangement of Occupational Titles and Codes"; Part III, "Supplement"; and Part IV, "Entry Occupational Classification." It was first issued in 1939 and a revised edition is planned for publication in 1948. Over 50,000 copies have been purchased from the Superintendant of Documents in Washington, D. C., and it has become the standard reference source not only for the U. S. Employment Service but for other governmental agencies and the Canadian government.

Standardization is necessary in describing jobs and occupations if the maximum utilization of the available information is to be achieved. The *Dictionary* has been a great aid in this direction. For example, the occupational information gathered in an industrial program carried out by the U. S. Employment Service led to interesting and somewhat unexpected results, such as the fact that a stone planer is able to do the job of a metal planer. The job analysis for these two jobs showed that the skills, aptitudes, and experience for both of them were essentially the same. The fact that the stone planer worked on different materials in a different industry was not as important as might be assumed. In another instance a close relationship was found between the job of a plasterer and that of an asbestos pipe coverer; the metamorphosis was completed easily by teaching the plasterer how to sew. Both the Army and Navy, during World War II, found that knowledge of occupational information expedited transfers from civilian to military occupations.

Dr. Carroll L. Shartle has compiled a valuable source book entitled *Occupational Information* (*9*). He has presented the available material in such a manner as to show clearly the need for occupational information on the part of industry, education, and the community. The book also contains pertinent facts on occupation trends and the labor supply and demand.

Occupational information based upon job analyses has resulted in information about "occupational families," or groups of related occupations with similar characteristics. This material is useful for business organizations that are considering the transfer and upgrading of personnel, and for communities seeking new industries. "Occupational family" information can also help the individual who is seeking a job.

Another value of occupational information is the increased knowledge it gives people about jobs. Most individuals have an extremely limited amount of information in this area. There are very few people who can name more than a few hundred occupations, and yet there are thousands of different ones.

An article by Shartle (*10*) serves as an illustration of the lack of knowledge that most people have concerning specific jobs. The need for occupational information is well brought out by examining the list of varied positions held by psychologists. The average person, and to some extent even the sophisticated college student, usually believe that a psychologist either teaches at a college or gives tests. Table 23 lists some of the positions held by qualified psychologists in various agencies, institutions, or organizations. This list makes it obvious that some of the positions are not clear, that is, they lack definition and description. A list of positions is useful but it must be supplemented by additional relevant material.

TABLE 23. Positions Held by Psychologists

College teaching
College counseling
Educational research
Public schools—psychologist
Clinical psychologist
Child guidance
Psychologist—feeble-minded institution
Psychologist—hospital for insane
Psychologist—penal institution
Court psychologist
Personnel examiner
Rehabilitation training officer
Personnel psychologist
Consulting psychologist
Public opinion survey psychologist
Psychometrician
Employment interviewer
Employment counselor
Occupational analyst
Vocational adviser
Vocational counselor
Research psychologist

SUMMARY

Job analysis is the minute description of the duties and requirements, as well as the man aspects, of the job. There are many uses to which a job analysis can be put and in many respects the job analyst does the fundamental work on which all training programs, personnel policies, and wage rates are based. Job analyses are relatively simple to perform and do not require much technical information or previous training. They should be made in small as well as large organizations, in offices as well as factories.

Two contributions which emphasize the psychologist's approach to the problem are the job psychograph, which defines the job in terms of specific traits; and the occupational ability pattern, which defines the job in terms of performance on a battery of psychological tests. A by-product of job analysis is the vast amount of occupational information which is useful not only in vocational guidance and selection but in connection with occupational trends in the labor supply and demand. This material plays an important role in the successful operation of a business.

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8. Job Training

THE job analyses described in the preceding chapter are valuable in the development of job training programs. An effective job training program results in increased production, reduced labor turnover, and greater employee satisfaction. Such a program should include all employees, from factory workers to executives. It should include the training not only of inexperienced workers but also of experienced workers new to the company, and the retraining of old employees by means of "refresher" courses.

Despite the fact that job training should be one of industry's responsibilities, there are many companies which seem to do their best to avoid it. Industry, in general, has attempted to get around the problem of training in two ways: (1) It insists on hiring skilled or experienced workers on the assumption that training will be unnecessary, or (2) it hires inexperienced people and turns them over to experienced employees for training, under the mistaken belief that a worker who is experienced but has no knowledge of training techniques can train an inexperienced person. Nothing is further from the truth. Although learning can take place without effective aids, it is uneconomical because it takes longer and does not permit the ineffectively trained worker to reach his maximum output.

The National Institute of Industrial Psychology carried out a series of experiments on two equated groups of workers. The essential difference between the groups was that one was hired and trained foı the job it was to perform, and the other group was put to work at the job in the usual manner. An investigation of about ten different jobs led to the conclusion that the trained group was from 10 to 40 per cent more efficient than the untrained group.

Psychologists have gathered sufficient information in the laboratory, the classroom, the Army, and to a certain extent in industry, to permit the knowledge about training to be classified into a series of general principles. When these principles become recognized and are included in a training program, training will be considerably more efficient.

EXPERIENCE VS. TRAINING

INDUSTRIAL workers are likely to regard with disfavor the inroads made by education. Many experienced workers seem to be members of a "secret society," with mysterious knowledge all their own which has come to them only after long years at a work bench. We often hear an experienced worker or a successful boss telling a young college graduate or a person who has studied the specific task in school that "this education business" is nonsense. The argument runs somewhat as follows: "Look where I am, and I didn't have any education." How much of this is discrimination or fear of young people or resistance to modern trends, and how much of it is sour grapes is hard to tell. On the other hand, people with formal training sometimes tend to belittle those who have gained their knowledge by experience. This merely pours salt in the wound. A young person with training but with little or no experience should use judgment and curb his missionary zeal by not insisting that he must train all those who have not had his training. This is just as ridiculous as the experienced employee objecting to anyone who has been trained.

Training cannot entirely take the place of experience, but when training is effective it can shorten the time required to reach maximum production. In fact, the training of new people is often the only means of introducing new and efficient work methods as a substitute for older and less efficient ways of doing a job. Experience can be a good means of training but this result is sometimes accidental. Experience that depends solely on trial and error or on the prodding of a poor teacher means trouble and a much longer uphill struggle to achieve competency. However, experience and training are not incompatible as methods of learning; for, in the proper proportion, both lead to the highest efficiency and maximum achievement in the shortest time.

Training, like education, can be regarded as a continuing process of life. This means that refresher courses are a "must" in any comprehensive training program. Of the many reasons for periodically retraining experienced employees, the most pressing one is the appearance, slowly but surely, of strange and inefficient work methods which interfere with the efficient methods learned originally. In addition to ironing out the kinks and removing the "bugs," refresher courses permit the continual introduction of new and improved work methods; they also serve to bolster morale since the individual employee is assured that the company is still aware of his existence.

PRINCIPLES OF LEARNING APPLICABLE TO INDUSTRY

REGARDLESS of the task involved, a clear similarity in the learning curve from task to task is evident. The curve is often characterized by a rapid increase in the earlier learning period and a tapering off toward the end of the process. The pioneer studies in this area conducted by W. L. Bryan and V. Harter *(1)* prior to 1900 resulted in the establishment of a learning curve for telegraphy; this is reproduced in Fig. 19. Another learning curve *(8)* is depicted in Fig. 20 to show the similarity in such curves.

Familiarity with the typical learning curve allows for comparison between it and any specific learning process in a particular plant. Marked deflections of the curve, if they are frequent, are likely to indicate that something is wrong with the training method. Since the quality of the teaching is vitally important, wide variations in what is learned are often the result of either efficient or inefficient teaching. Anyone who has ever been to school knows the difference between a good teacher and a poor one; it cannot be assumed that everyone can teach equally well.

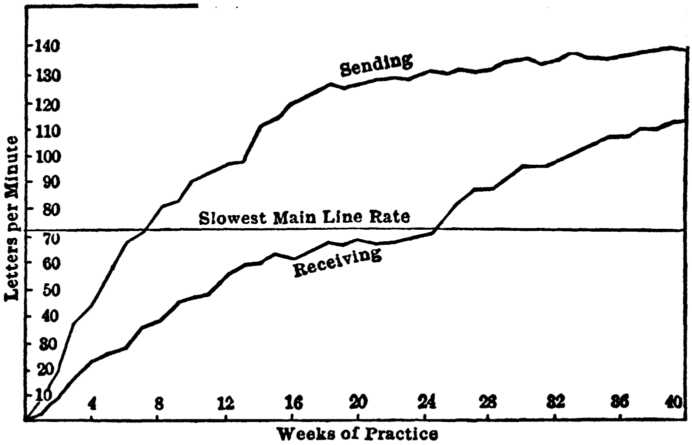

FIG. 19. A Learning Curve. (From W. L. Bryan and N. Harter, *1*.)

The role of motivation is very important in learning; little if any progress occurs without it. Whereas students often spend three inefficient years in school attempting to learn a foreign language, the Army's recent experience demonstrated that the average person can be trained to conduct a conversation in a foreign language in a matter of months. Only part of this vast difference in effectiveness is attributable to better teaching techniques; most of it is due to the stronger motivation in the Army. The G.I. could be made to understand the reason for studying a foreign language much more readily than the high-school student; the latter was probably convinced that it was just a useless requirement imposed on him by a "bunch of old fossils."

Effective motivation is the essence of learning, and one who is teaching a group should take pains to insure correct motivation, or little learning is likely to occur. A man who has been promised a promotion provided he takes a specific course will learn its content in a comparatively short time. A girl who hopes to obtain a job as secretary will learn to type and take dictation in as little as six weeks. Without the specific motivation of a job, both these individuals may dawdle along for years. Many college students insist that they learned the entire content of a course in a few nights. In the "cram" session they discover that there is much useful material that they should have learned during the course, but the motive for learning was too remote then. When passing the final examination is their only motive for learning, they learn.

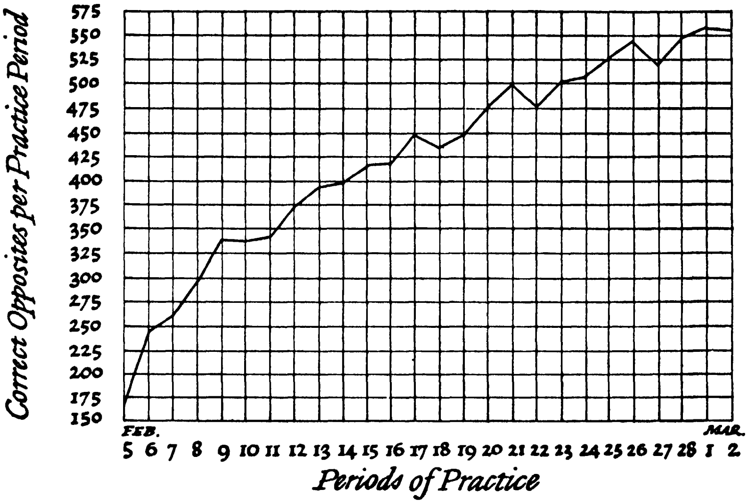

FIG. 20. A Learning Curve. (From F. L. Ruch, *Psychology and Life*, Scott-Foresman and Company; adapted from Thorndike, *Adult Learning*, Macmillan, 1928.)

A difficult problem in connection with the learning process is the determination of the length of the learning period. Although this varies from task to task, the average person is not capable of continually absorbing new material. Signs of "fatigue," boredom, inattention, and other aspects of inefficiency should determine the length of the period. Rest pauses and breaks in the learning process should be introduced. When learning mental tasks, a ten-minute rest every hour not only is welcome but aids in the learning process. In learning motor activities, fifteen minutes to half an hour is about as long as a learning period should be without a rest; however, this varies with the type of activity. The length of the training period should be given careful attention, because too long a period will often do more harm than good.

Another decision which must be made concerns the amount to be learned. Although psychologists generally favor the learning of a complete unit because of its meaningful nature, they recognize that a complete unit can be broken down into smaller but equally meaningful parts. This applies to such students as tile setters, carpenters, and typists as well as students in college courses. It is up to the instructor to integrate the material so that the student can fit the parts together correctly. Unless the individual has learned to perform the various parts of the unit correctly, the complete unit will give him difficulty.

An effective aid in learning is knowledge of progress. The Marrow study referred to earlier (pages 110-111) showed clearly that when the subjects knew they were making progress toward intermediate goals, more of them achieved the final goal. When the unit to be learned was too large and when the goal was too remote, it seemed as though no appreciable progress was made. When progress in the task to be learned can be shown graphically, this should be done by the student. Thus the amount of type set in a five-minute interval, measured once every hour or two during the learning process, will act as a tonic to the apprentice typesetter; and counting the number of words typed in a five-minute interval will show the student typist his progress in concrete form.

The numerous experiments made by psychologists and educators to determine whether accuracy or speed should be emphasized in training indicate that the initial emphasis should be on accuracy, regardless of whether the person is being trained to inspect manufactured parts, to sort dog collars for size, or to typewrite. Within a few days or weeks those who have been trained in accuracy are not only more accurate than those trained for speed, they are quicker as well.

The existence of individual differences is axiomatic in psychology; their range varies with ability. Since training heightens these individual differences, every effort should be made to select people who will benefit most from the training offered. Many attempts have been made to measure the degree of these individual differences. Table 24, adapted from Hull *(4)*, shows that the ratio of 1 : 2 is common between the poorest and the best performance of individuals doing the same task.

TABLE 24. Ratio of Least Efficient to Most Efficient Individual in a Variety of Gainful Occupations

Occupation	Criterion	Ratio of Poorest to Best Worker
Heel trimmers (shoes)	No. of hours per day	1 : 1.4
Loom operators (silk)	Per cent of time loom is kept in operation	1 : 1.5
Hosiery maters	Hourly piecework earnings	1 : 1.9
Loom operators (fancy cotton)	Earnings	1 : 2
Knitting machine operators	Pounds of women's hose produced per hour	1 : 2.2
Elementary school teachers	Ratings of superiors	1 : 2.5
Spoon polishers	Time per 36 spoons	1 : 5.1

Learning should be regarded as a real life process in which all the sense modalities are permitted to take part. This means learning by seeing as well as learning by feeling. Moreover, a learning process that merely allows the person to watch is not sufficient; there must be successful integration between "Now watch me" and "Now do it yourself." An individual may learn to drive an automobile by watching, but most people had better not consider themselves drivers until they have also driven a car.

Too often the concept "plateau" appears in connection with the learning curve. This is an overstated and overworked idea. Sometimes, there is a flatness in the learning curve which is eventually followed by a spurt. This flattening indicates a period of no apparent progress and is referred to as a plateau. There are many reasons for the appearance of a plateau in the learning process. It may be the result of lack of motivation, inefficient methods, or, very often, ineffective teaching or poor training. However, a plateau is *not* an integral part of the learning process; hence one should not be concerned by its absence.

THE ROLE OF SCHOOLS AND COLLEGES

THE trend in education in recent years has been toward specialized training. The rise of business and engineering colleges in popularity, coupled with a general decrease in the proportionate enrollments in schools of liberal arts, illustrates this point. Recent developments in higher education have taken the form of junior colleges aimed at specializing for industry.

A newly organized school in New York City, which functions at the junior-college level, is known as the Fashion Institute of Technology and Design. It is supported in part by the Board of Education of New York and in part by an educational foundation of the needle trades. The school offers college subjects, but in addition gives specific training for work in any of the many divisions of the needle trades, such as gloves, underwear, suits, dresses, shirts, blouses, and millinery. Its graduates are trained in illustrating, designing, and production control, and also in the techniques of sewing and draping. A feature of this school is the cooperative education in effect in the last semester. During this semester each senior goes to school for two five-week periods and works in industry for two five-week periods. When students are in school, alternates are on the job. The school makes a real attempt to place a student in the specific industrial job for which he has been training. This coordination of job experience and classroom work gives the graduates working experience and a knowledge of a job in a factory, sample room, or other department of an industrial establishment, as well as the knowledge gained in the classroom. These students know what the pressure of production means. (They also learn prematurely how to "soldier" on the job.) They see clearly the tie-up between education and job training. Since most people must eventually enter an office, factory, or profession, such real experience in addition to a more general education is of decided value.

Some industries and specific companies conduct their own training schools, not only to make sure of having acceptable applicants, but also because they recognize the importance of this training. An outstanding example is the Ford school in Dearborn, which trains young men in automobile mechanics and related fields.

Industry generally does not recognize its responsibility for training workers. The chief reason for this is possibly the lack of facilities and of "know-how." In the past, because of an undue fear of the taint of commercialism, schools and colleges have too often refused to recognize the service they can perform. Cooperation between these two great forces in the training of workers has been conspicuous by its absence. The trend in this country is toward more and better education. Many people predict that the large number of students now attending colleges will continue unabated; they believe the "G.I. Bill" is an impetus but that enrollment will continue above pre-war levels.

This G.I. bill has brought a tremendous increase in job training schools, and many of these are taking on cloaks of respectability. Now is the time for both industry and educational institutions to cooperate in making training in industry more realistic and more valuable.

TYPICAL TRAINING DEPARTMENTS IN ACTION

THE average worker insists that he was never trained for his job, regardless of whether he has worked for small or large organizations. By and large this is true. Business organizations must recognize their responsibility and create training departments on a larger scale than has been done in the past.

The training responsibilities of an industrial or business organization are clear cut and its training program can be considered as having two functions. The first, a general orientation in company policies, routines, and rules, should attempt to assimilate the new employee as rapidly as possible so that he may overcome his feeling of being a stranger. The second function concerns the specific job training. The training programs of companies, large and small, generally are weak in both these aspects.

The writer is reminded of the time he was hired as a factory operative in a large manufacturing concern. After a series of interviews and a physical examination he was assigned a number, given a time card, and sent to a specific department. After showing his credentials to the department supervisor, he was seated at a work bench and told, "This is Joe. He will tell you what to do." Joe who seemed rather annoyed, said merely, "The best way to learn is to help me do this." At the end of the day the supervisor came over and asked for the new man's production. Obviously there was none because he had been helping the man who was supposedly training him. Rather than say this and get into trouble with Joe, the writer said that he had not produced anything because he thought he wasn't supposed to work the first day. The supervisor looked at him in a manner that he clearly understood—it suggested that he was pretty dumb—and said, "Be sure that you produce tomorrow." The next day he went to work, asking as few questions as he could and without annoying Joe. Of course, his production would have been greater if he had had at least an hour's demonstration and training. Some time later he discovered that Joe disregarded him, not for personal reasons, but simply because he himself had to produce his usual amount of work and was given no allowance for the time spent in training a new man.

At another time the author was hired as a salesman in a large department store. For three mornings he listened to instructions and practiced writing out all the parts of weird sales slips covering transactions which rarely, if ever, occurred in a normal day; and when they did occur, no one would have known how to handle them, with the possible exception of the section manager. The author was given none of the necessary information about the merchandise he was to sell, because the people who were going to sell underwear were being trained at the same time as the people who were going to sell ties or any of the many other items which make up the inventory of a large department store. After the training program was completed, he was put to work selling on the main floor. But he had an empty feeling in his stomach; he was in conflict. He had passed the training examination with flying colors but knew nothing about selling men's underwear—nothing about the different sizes and how to measure them, nothing about the various materials, and nothing about the stock. He could make out all varieties of "await orders," but nobody wanted those. The customers wanted to buy underwear.

In some smaller organizations, after the employee is hired and put to work, he is told to ask any questions he wants to; but since it is never made clear who is supposed to answer these questions, the average worker gains experience by struggling along meekly on a hit-or-miss basis. Industry can and should do a better job. It is not necessary for an organization to make a fetish of training; but hiring an experienced educator or psychologist on a consulting basis for one hour a week over a short period, such as a month or two, will often enable it to set up a training program that is infinitely better than the one it does not have at present.

THE TRAINING STAFF

TRAINING in industry is given most frequently by an experienced operator. The supervisor and the special instructor follow in that order. Oddly enough, there is often an inverse relationship between this order and effectiveness in training. There is absolutely no reason for assuming that an experienced operator is a good teacher; such an operator is often not capable of even describing the method he uses. People who are excellent ice skaters often cannot teach anyone else to skate; the same applies to expert tennis players, carpenters, electricians, etc. It is necessary to train the experienced operator in training techniques before he can be considered an effective trainer. What applies to the experienced operator also applies to the supervisor. Although it is true that the supervisor may know how to handle people, he may not know how to do the specific task in question. The best method of training in industry is to have a special instructor who can adequately do the job and who knows how to teach as well; the latter is essential. Very frequently this means training the trainer.

Alex Bavelas, of the Industrial Relations Section of the Massachusetts Institute of Technology, has clearly demonstrated this point. He has conducted a number of studies which indicate that the training of trainers results in better performance by the people being trained. He suggests that trainers be given training through discussion methods, so that they will better understand the implications of attitude and motivation in a training program. In one study he devoted eight hours to such a course; the results indicate that differences in employee ability exist when performance is measured under three conditions: without training of the trainers, with four hours of training, and with the full eight-hour course.

The fact that experienced operators are not necessarily good trainers is seen clearly in the familiar situation wherein an experienced automobile driver attempts to teach his wife the intricacies of driving. Within half an hour he has usually lost his temper and has told her that she will never learn to drive, and she is tearfully vowing that she will never ask him to teach her another thing; it is pretty certain that she will not get into the car again. But within a day or two this blows over and a second lesson is attempted. This ends the same way, except that now they both insist that she go to school to learn how to drive. Whether it is an official instructor or a neighbor, she will, given a considerable amount of "patience and fortitude," finally learn.

THE CONFERENCE ON EDUCATION AND TRAINING IN INDUSTRY

An outstanding contribution to the field of training in industry was made by the conference on Education and Training in Industry held jointly by the New York Chapter of the Society for the Advancement of Management and the Extension Division of the School of Business of the College of the City of New York during May, 1947. It is rare that such a conference produces anything beyond glittering generalities and empty platitudes, even when the people who participate know better. This conference was different. A résumé of its highlights will best illustrate the views of present-day experts in the field of training in industry.

The Socony Vacuum Company described its training program. This company has for its training objectives the goal that *every* employee be thoroughly informed as to his responsibility, his authority, and his relationship with other people. The training, which is provided on a continuing basis, attempts to develop favorable attitudes, provides useful information, and encourages learning by doing. Furthermore, the training program informs the employees about the company's products.

The importance of training is recognized by the company's "top management," and they show this by participating in the program. Training takes many different forms, such as training for advancement, management training, apprentice training, training of technical people, and training of distributors. Teaching assignments are given to the men with experience after they have been taught the rudiments of good teaching. Training takes place on the job, in the classroom, and in the shop. Lectures, discussions, demonstrations, and home-study materials are used. Manuals have been prepared and gadgets devised to drive home the various points. Training has been developed to such an effective level that many college professors could take a course or two with this company and learn much about teaching.

The appliance and merchandise department of General Electric has a very different approach to training. In collaboration with the LaSalle Extension University, a home-study course in electric appliance salesmanship has been prepared. The course, which costs $17.50, includes seven assignments which are mailed to the student, one at a time, at three-week intervals. The student mails his problem papers to LaSalle and if he gets passing grades for all seven assignments he receives a diploma. In the first six months after this course was introduced, 15,000 people from all walks of life—retail store owners to sales managers—enrolled. This is "big business."

This division of G.E. also conducts what it calls "personal training," which is offered at three types of meetings: company, distributors, and dealers. Visual aids are emphasized in this training.

The International Harvester Company of Chicago has recently signed a contract with the University of Chicago. This offers an ideal example of what can be achieved when "company funds" and "college brains" get together. The training courses offered in the Central Sales School are only part of the program. These courses are broken down into four areas: orientation, personnel development, management operation, and technical aspects of the job. The program is handled on a mass scale, inasmuch as 17,000 men have graduated from the school in one year. In addition, plants to train the supervisory personnel along the lines of centralized and individualized needs are being developed. Harvester's training program recognizes not only the need for employee orientation but also the value of off-hour training directed toward the employee's intellectual pursuits, recreational inclination, and personal and domestic situation. This company regards its entire training program as a social contribution to the need for better-informed adults in America. It is interested in developing individuals, not simply in training men.

The relationship between Harvester and the University of Chicago is exceedingly interesting. Since it is hoped that their cooperation will serve as a model for future collaboration between industry and the colleges, the opening paragraphs of their contract are quoted.

> The International Harvester Company is interested in developing a program of training and education which will increase the feeling of unity in the organization; develop individuals in the company for responsible positions; facilitate the absorption of new employees and returned servicemen and

women into the organization; and, in time, contribute to a better understanding of the application of machinery in agriculture. To achieve these ends, the company plans to develop the appropriate staff and physical facilities within its organization. In the development of these plans, the advice and counsel of specialists in adult education, business education, vocational education, etc., on the staff of a leading university would be welcome.

The University of Chicago through its Department of Education in the Division of Social Sciences and through its School of Business is interested in studying methods and procedures for communicating information of varying intellectual contents to individuals of varied backgrounds. The experience attained within a university and its laboratory schools is restricted both in regard to intellectual content and the heterogeneity of the individuals with whom it comes in contact. For these reasons the University welcomes the opportunity to cooperate in the formulation of objectives, development of instructional methods, and the measurement of the achievement of the objectives made possible by the educational plan of a large industrial organization.

It is therefore proposed that the International Harvester Company and the University of Chicago enter into a working relationship to achieve their mutual ends.

The role of this university in training instructors for the Harvester Company shows that college professors can improve instruction for industrial training. They emphasize that trained instructors should devote their attention to what the students are learning rather than concentrate on lecture organization. The company instructors are taught to define objectives not in terms of content but in terms of the students' changes in behavior. They are also taught to eliminate non-essential material from classroom courses.

The Electric Auto-Lite Company emphasizes visual aids in its training program. In fact, Walt Disney's first industrial production was made for this company. The film, which runs 18 minutes and cost about $75,000, is designed to teach the correct installation of spark plugs; to date, over 200,000 people have seen it. The company is proud of its Library of Congress award for producing one of the outstanding training films of 1945.

General Motors, which in 1946 employed an average of approximately 97,000 salaried and 203,000 hourly employees in the United States, has a gigantic training program covering many areas. The training in the field of management and supervision includes many different specialized programs. The company has a large apprentice training program and does considerable "on-the-job" training. It also conducts an institute featuring cooperative education. The courses offered vary from special classes of a few days' duration to a four-year course, which, together with certain prescribed postgraduate work in the fifth year, leads to an engineering degree.

SUMMARY

INDUSTRY generally tends to shirk its responsibility for training its workers, preferring to handle the problem by hiring experienced employees. Experience and training are not incompatible methods of learning but are two aspects of the same process. Training, when effective, is likely to result in greater efficiency in a shorter period of time. Psychologists have gathered information about learning which can be effectively applied to training in industry. Knowledge of the learning curve, length of the learning interval, size of the unit to be learned, awareness of progress, emphasis on accuracy, and learning by a combination of doing and seeing are all vital in an effective training program. Schools and colleges can be of considerable help to industry in training applicants for jobs; more cooperation between these two groups is desirable. Cooperative education shows considerable promise in the integration which can be achieved. Generally speaking, in larger organizations training departments are inefficient; in the smaller organizations they are non-existent. Both large and small concerns can benefit from assuming training responsibilities. Finally, it is important to recognize that an intelligent worker or supervisor is not necessarily a good trainer, but he may be made one after being trained along this line.

A few companies have recognized the importance of training and education in industry and have formulated very successful programs. The problem of effective training programs can best be solved by industry and the colleges working together, each contributing what it is best fitted to contribute to the success of a continuing plan.

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9. Time and Motion Studies

TIME and motion studies have as their objective the elimination of waste and inefficiency. This is achieved through the reduction of costs, the improvement of work methods, and the minimizing of work fatigue. Establishment of a basis for effective training and the determination of wage rates are also results of these studies. In time studies, the emphasis is on determining the standard time required to complete a task. In motion studies, the methods, motions, and movements of the worker are analyzed. Whereas these two studies, were once treated separately, they now are often combined, for both are intimately related; rarely is there justification for performing one without the other.

The stock in trade of the "scientific manager" or the "efficiency expert" is usually a variation on the theme of time and motion studies. This subject has for some years been a controversial one, with management glorifying it and labor condemning it. Both sides have been right and wrong at the same time. The main difficulty has resulted from the misapplication of time and motion studies. If, as a result of these studies, more efficient production was achieved through a rearrangement of tools, fatigue was decreased, and costs were reduced, with, at the same time, a fair increase in the earning capacity of the employees, there could be no valid objection. To object to time and motion studies on the ground that they result in more efficient work is not only illogical but often emotional. Nevertheless, the objection has been heard that, too often, they are not concerned with a general increase in efficiency, but are used as an excuse for a speed-up or for the dismissal of employees. This objection is valid, but it is not so much a criticism of these studies as of their misapplication. It is important to emphasize that time and motion studies need not be unfair. They can be useful in promoting the aims of both management and labor, provided they are carried out correctly and are not misapplied. Furthermore, when they lead to increased efficiency, they must result in some gains to the worker as well as to management.

POTENTIAL FAILURE OF TIME AND MOTION STUDIES

DESPITE the objectives of a time and motion study, and the "scientific" attempts to measure the time and motions involved in the performance of a task, the average study in industry is doomed to failure and is likely to be scrapped. This is a radical statement, but it is made in spite of the facts uncovered and the claims made; it also contradicts much of the literature in the field which has appeared since Frederick W. Taylor's work in the 1890's. Time and motion studies in and of themselves are not nearly the formidable bulwarks of efficiency that they appear to be on cursory examination.

The psychological components of time and motion study are very important. Whenever these are overlooked—and they often are—these studies become ineffective tools in the hands of fools. Under these circumstances they do not produce greater efficiency, they merely produce greater dissatisfaction. The idea here is not that such studies are morally wrong, but that unless the problems that result from them are recognized, these studies can never really have a chance to accomplish anything of value.

The story of Johnny will illustrate the point. Johnny was the informal leader of a group of employees in a certain department of one of the Western Electric plants. He and his group were on a piece-rate basis and were earning more than the average hourly rate for similar departments. This resulted in a series of visits from a man who made time and motion studies. Before going into the reasons why his studies failed in this instance, some background material is necessary. A description of Johnny and his co-workers is desirable for an understanding of the total situation.

In many respects they were just like any other group of factory workers, and in some respects "even more so." A college professor might consider them a rough and tough bunch. But they really were not. They were young, aggressive, and totally uninterested in education. They had two hobbies. All of them were amateur prize fighters, and they liked to train "on the job." Whenever the foreman was away they were likely to do a little sparring. Their enthusiasm was real, and every now and then someone would be "knocked out." Naturally the presence of a body in a prone position caused some dismay, but the problem was usually solved by rolling the fellow under a work table. None of them ever really got angry over this because the next bout might result in a reversal of the decision.

Their second hobby was trying to put something over on the special policeman stationed at the entrance of the factory. They regarded him as a person who distrusted them and they accepted this challenge by seeing how successfully they could slip pieces of equipment past him. At first it was only parts, but later it was telephones. That they had no earthly use for the equipment was proved by their practice of bringing it back into the factory undetected.

Their work methods were also highly individualistic and aggressive. The telephones which they were to disassemble arrived on rather large hand trucks. Whenever such a truck left the elevator someone in the group would give a blood-curdling yell, "Breaks." This was the signal for all of them to stop work immediately and rush to the truck. In their language a "break" was a telephone partly disassembled at the time it reached them, which meant less work for them to do. All of them pushed and fought for these "breaks," cramming them under one arm and grabbing for others with their free hand. The one who collected the greatest number of the telephones was the winner and he strutted accordingly.

As indicated, this group consisted of a number of highly aggressive individuals who delighted in physical violence and rather violent horseplay. With this knowledge of the group, we can return to the man who made the time and motion studies.

In this company, this man's identity was immediately recognizable. He wore a white starched shirt without a coat and carried a board with a clock inserted at the top. He would stand behind the worker with one foot on a stool and observe the employee on the job.

In the case of Johnny's group the time and motion study man made a series of trips. Before long he observed only Johnny, who incidentally was the best worker. Johnny, however, always slowed up when he appeared. When the man accused him of this, Johnny always answered, "If you can do the job better, why don't you do it?" Since the time and motion study man could not do the job, he had to be content with merely observing and making notes. After a period of time, the rates were changed. Johnny's group objected to this, but at the same time saw to it that the change did not affect their total earnings. Their goal was to earn about $10 a week more than the prevailing hourly rate, and they did. At first they did not fool around so much, but the more stringent control of rates led them to change their entire work method. (This was unknown to the company or at least to the time and motion study man.) Within three months they became a highly cooperative group. When the telephones arrived on the floor, there was no rushing to the truck. One man rolled the truck to his station and began to remove the base of the phone. Then he passed the phone to the man who did the next step in disassembling, and then it went to the third and fourth men until, in their language, it was stripped. The fifth man served as a substitute and was also responsible for watching for an unexpected visit from a supervisor or a time and motion study man.

This story illustrates how these workers, by their own efforts, overcame the wage rate set by the time and motion study man. They had to increase their production but they maintained their earnings. Dissatisfaction also increased in the group, as evidenced by their vocal disapproval of the company and its policy.

Another illustration along the same line is a story told by Mr. Ruttenberg, formerly of the C.I.O. After stating that when standards are set exclusively by management without the men's participation, the company does not obtain anywhere near top production, the president of one of the largest companies in Pittsburgh challenged him to prove his point. In accepting this challenge, Ruttenberg requested the company engineer to tell him which job he thought most ideal for the test, i.e., the job with the greatest production. He thereupon offered to double this production in a month. Ruttenberg talked with the men on the job and assured them that a production rise would not affect their rates. In a month they had achieved 210 per cent production.

Most time and motion studies, however, do not constitute a challenge to employees, as in these two instances; rather they result in what might be interpreted as a concerted effort on the part of the employees to prove that the new method is no good or that the new gadget is a waste of time. And they resist the change. The resistance is psychological in nature, but it must be reckoned with if time and motion studies are to lead to greater efficiency without a decrease in employee satisfaction.

RESISTANCE TO TIME AND MOTION STUDIES

THERE are three major forms of resistance to time and motion studies: (1) objection to change, (2) the fact that the change is initiated by an outsider, and (3) the worker's increased feeling of insecurity. People are not capable of adjusting to rapid change. This applies to changes in doing a job as well as to changes in social codes.

An example of resistance to newness is the objections to prefabricated houses. If the housing problem is to be solved within a short space of time, homes must be built at a cost which the average person can afford. The prefabricated house, as at present developed, offers a real possibility of a solution. The mere mention of the words prefabricated house makes most people think that the house will fall apart, that all such houses are exactly alike, and that they have no resale value. All these opinions are false. However, these misbeliefs are not the only obstacles. Prefabricated homes are far from being in the mass-production stage. Builders resist them, labor resists them, and communities draw up building codes to prevent their construction. For example, a man who has been building homes in Westchester County, New York, for over thirty years recently bought a prefabricated seven-room bungalow for his own occupancy in an exclusive residential district. It cost him $12,000, not including plumbing, heating, electricity, and other facilities—in other words, it was not cheap. The residents of this section, some of whose homes had been built by this man, protested on the grounds that the prefabricated structure would reduce the value of their property. The village Board of Trustees conducted hearings and then modified the building code so as to require all new homes to be built on plots of at least 10,000 square feet. The owner of the prefabricated house had a plot that measured only 9900 square feet. In addition, the modified code now required wall sheathing to be at least three quarters of an inch thick. From an engineering and architectural point of view, there is no need for this in a one-family house; the prefabricated house was to have half-inch sheathing. The building inspector explained that the changes in the code were not aimed at prefabricated houses but were merely a protection against "cheap houses." Most of us will agree that a $15,000 house, while not a mansion, is not cheap. Statistics indicate that most people in this country can afford homes costing only $4,000 to $6,000.

Resistance to newness is also apparent in the automobile industry. People who bought a 1946 or 1947 Studebaker had to be courageous and stand for a lot of jokes about the "window car." The Kaiser-Frazer automobile does not seem to be as popular as other makes even though the model itself is not radical in design; it is just a new car. Many people refer to it unkindly as the car turned out in the "Will It Run Plant" (not the Willow Run Plant).

Some people still refer to prohibition as "the noble experiment." However, the legislation prohibiting the consumption of alcohol served primarily as an invitation to resist prohibition. The activities of college fraternities during and after prohibition lead one to the conclusion that more drinking was done then than before prohibition. Watching the behavior in the grandstands at football games both during and after prohibition leads to the same conclusion.

We must recognize the serious implications of this resistance to change and newness. Time and motion studies often point to the fact that something new is needed in the job. The new thing may lead to improvement, but when it is introduced no improvement will be apparent because the worker will resist it, not because it is a better way of doing the job but because it is a "new" way.

The second objection to a time and motion study is the fact that an outsider initiates the change. Practically every worker does his job in a certain way and has his reasons for doing it that way. He resents being told by someone that he is not doing it efficiently. He may suspect that the outsider is there to "show him up" and he naturally will do all that is humanly possible to prevent it. The best way to defeat the purpose of a change is to have an "outsider" propose the change. Whether it is a worker on his job or a community with a difficult problem, the importation of experts or "outsiders" either retards or halts progress in the direction of the desired change. Thus Johnny's group decided at all costs, to show up the time and motion study man, regardless of the change in their rate.

The "efficiency expert" who comes into an office and sets up a new filing system or installs a centralized stenographic pool may have the right idea, but the workers will not believe it and they will manage to adopt as little of the change as is possible. Furthermore, when supervision is relaxed, they are likely to go back to their old method, not only because they dislike the new ways but because they still resent the intrusion of an outsider.

The third resistance to time and motion study, increased feelings of insecurity, is in part psychological and in part economic. Too often in the history of time and motion studies the results have been used to speed up production and lower wage rates. Even though a specific employee may not have been involved, he has heard about such cases and regards these results as an end product of time and motion study. Insecurity increases, and he often fears that he will be dismissed from his job. Hence he does all he can to avoid having his pay lowered or being fired. His usual defense is an attempt to show that the new method will not work.

MEN IN MOTION

The father of "scientific" management was Frederick Winslow Taylor, a mechanical engineer. According to him (*17*) "scientific" management (the quotes are mine) is based upon the firm conviction that the interests of the employer and the employee are the same, and that this system makes it possible to give the workman what he wants most—high wages—and the employer what he wants —a low labor cost. Taylor proposed scientific management as opposed to "management of initiative and incentive." He believed that his system was scientific because it gathered together the knowledge formerly possessed only by workmen and classified, tabulated, and reduced it to laws, rules, and formulas. He proposed that management take on new duties, such as (1) developing a science for each element of a man's work, (2) scientifically selecting and training workmen, (3) cooperating heartily with the men, and (4) taking over all duties and work for which it is better fitted than the workmen. Taylor states in summary, "Under the management of initiative and incentive practically the whole problem is up to the workmen, while under scientific management fully one-half the problem is under management." To be perfectly blunt, either Taylor must have been a supersalesman or industry in 1890 was very primitive and its executives very naïve. Analyzing Taylor's system and the manner in which it was put to use allows no justification for the term "scientific."

The Taylor study which has achieved historical importance is the "Pig-Iron Handler," a study of a gang of men loading pigs weighing 92 pounds and loading an average of 12½ tons per day. Taylor's lack of concern and sympathy with workmen is revealed in his statement, "This work is so crude and elementary in its nature that the writer firmly believes that it would be possible to train an intelligent gorilla, so as to become a more efficient pig-iron handler than any man can be." His lack of sympathy and respect is further reflected in the way he reports his handling of a worker named Schmidt (*17*, pp. 44 ff.):

"Schmidt, are you a high-priced man?"

"Vell, I don't know vat you mean."

"Oh yes, you do. What I want to know is whether you are a high-priced man or not."

"Vell, I don't know vat you mean."

"Oh, come now, you answer my questions. What I want to find out is whether you are a high-priced man or one of these cheap fellows here. What I want to find out is whether you want to earn $1.85 a day or whether you are satisfied with $1.15, just the same as all those cheap fellows are getting."

"Did I vant $1.85 a day? Vas dot a high-priced man? Vell, yes, I vas a high-priced man."

"Oh, you're aggravating me. Of course you want $1.85 a day—every one wants it! You know perfectly well that has very little to do with your being a high-priced man. For goodness' sake, answer my questions, and don't waste any more of my time. Now come over here. You see that pile of pig iron?"

"Yes."

"You see that car?"

"Yes."

"Well, if you are a high-priced man, you will load that pig-iron on that car tomorrow for $1.85. Now, do wake up and answer my question. Tell me whether you are a high-priced man or not."

"Vell—did I got $1.85 for loading dot pig iron on dot car tomorrow?"

"Yes, of course you do, and you get $1.85 for loading a pile like that every day right through the year. That is what a high-priced man does, and you know it just as well as I do."

"Vell, dot's all right. I could load dot pig iron on the car tomorrow for $1.85, and I get it every day, don't I?"

"Certainly you do—certainly you do."

"Vell den, I vas a high-priced man."

"Now, hold on, hold on. You know just as well as I do that a high-priced man has to do exactly as he's told from morning till night. You have seen this man here before, haven't you?"

"No, I never saw him."

"Well, if you are a high-priced man, you will do exactly as this man tells you tomorrow, from morning till night. When he tells you to pick up a pig and walk, you pick it up and you walk, and when he tells you to sit down and rest, you sit down. You do that right straight through the day. And what's more, no back talk. Now a high-priced man does just what he's told to do, and no back talk. Do you understand that? When this man tells you to walk, you walk; when he tells you to sit down, you sit down, and you don't talk back at him. Now you come on to work here tomorrow morning and I'll know before night whether you are really a high-priced man or not."

By introducing rest periods and closely supervising the job, Taylor increased Schmidt's production (provided it was average) from 12½ to 47½ tons per day, an increase of 280 per cent. Schmidt's salary was increased from $1.15 per day to $1.85, per day, or 61 per cent. The present writer makes no claim that Schmidt should have received a 280 per cent salary increase, but it is apparent that the salary increase was disproportionate to the increase in production. It is entirely possible that a problem which still confronts America's mass-production industry originated with the Schmidt episode.

Another aspect of Taylor's work involves scientific selection of workmen. He glibly stated that only one man in eight can produce 47½ tons per day. This meant job changes for seven out of every eight men on a gang. There is a great likelihood that his norm for production was too high, and that his selection was not scientific.

To understand Taylor, it is necessary to refer to his early work at Midvale Steel (*17*, pp. 49–50).

As soon as the writer was made gang-boss, one after another of the men came to him and talked somewhat as follows:

"Now, Fred, we're very glad to see that you've been made gang-boss. You know the game all right, and we're sure that you're not likely to be a piece-work hog. You come along with us, and everything will be all right, but if you try breaking any of these rates you can be mighty sure that we'll throw you over the fence."

The writer told them plainly that he was now working on the side of the management and that he proposed to do whatever he could to get a fair day's work out of the lathes. This immediately started a war; in most cases a friendly war, because the men who were under him were his personal friends, but none the less a war, which as time went on grew more and more bitter. The writer used every expedient to make them do a fair day's work, such as discharging or lowering the wages of the more stubborn men who refused to make any improvement, and such as lowering the piece-work price, hiring green men, and personally teaching them how to do the work, with the promise from them that when they had learned how, they would then do a fair day's work. While the men constantly brought such pressure to bear (both inside and outside the works) upon all those who started to increase their output that they were finally compelled to do about as the rest did, or else quit. No one who has not had this experience can have an idea of the bitterness which is gradually developed in such a struggle. In a war of this kind the workmen have one expedient which is usually effective. They use their ingenuity to contrive various ways in which the machines which they are running are broken or damaged—apparently by accident, or in the regular course of work—and this they always lay at the door of the foreman, who has forced them to drive the machine so hard that it is overstrained and is being ruined. And there are few foremen indeed who are able to stand up against the combined pressure of all of the men in the shop. In this case the problem was complicated by the fact that the shop ran both day and night.

The writer had two advantages, however, which are not possessed by the ordinary foreman, and these came, curiously enough, from the fact that he was not the son of a working man.

Referring to the third item in Taylor's system, cooperation with the men, cooperation for him cannot be interpreted in the sense that cooperation was used in the chapter on morale. Taylor attributed his success as a gang boss to two facts: (1) that he was not the son of a workingman and management would therefore believe him sooner than an ordinary worker, and (2) that he was different and lived apart from the other workmen. From this point of view he cannot possibly be talking about true cooperation.

Taylor also believed that increases of more than 60 per cent in the uniform wages usually paid would make the men shiftless, extravagant, and dissipated. He reported this after referring to a long series of experiments and observations but he did not mention the type of experiment; it does not appear that his observations were unbiased. Since his time, wages have gone up considerably more than 60 per cent and workmen have not become shiftless, extravagant, and dissipated. Taylor represents those who believe that the average workman is dull and has no interests except earning more money, but that he is so stupid that earning too much is bad for him; therefore management is protecting him by keeping his salary increases small.

A world of difference exists between Taylor's views and the present-day views of many industrial psychologists and industrial engineers. Some of these differences can be attributed to the work which has been done by Frank B. Gilbreth, an engineer, and his wife Lillian, who was trained in psychology. Since his death some years ago, Lillian Gilbreth has carried on their work and is still active.

The first work done by Frank Gilbreth in this field was in connection with brick laying (*4*). His first study involved much more than the introduction of rest periods and constant supervision of the worker on the job. It was a minute study of the motions involved in brick laying and it enabled him to reduce the motions from 18 to 5, thereby increasing production from 120 to 350 bricks per man-hour.

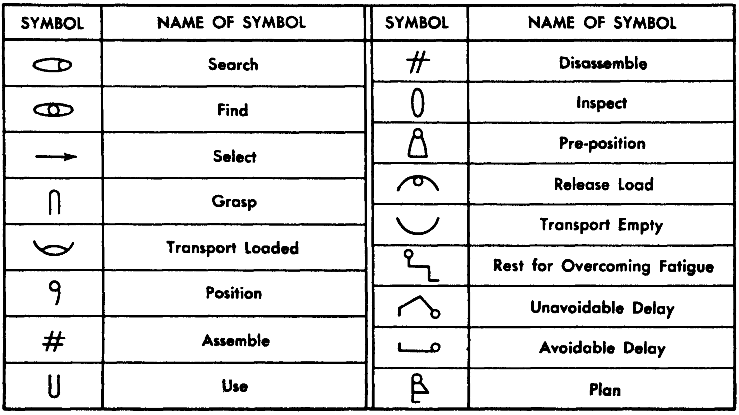
The two Gilbreths worked together very closely and the results of their work demonstrate the advantages in having an engineer and a psychologist work in cooperation. From their training, the engineer and the psychologist acquire a great deal of complementary information. Alone they can make serious mistakes. Together they can make real progress. They can act as a check on each other so that the human element does not cause neglect of the mechanical, and vice versa. It is indeed too bad that such teams are not more frequent.

The Gilbreths devised a system of efficiency that included nine principles, namely, (1) individualization, (2) functionalization, (3) measurement, (4) analysis and synthesis, (5) standardization, (6) records and programs, (7) teaching, (8) incentives, (9) welfare.

Their system was all-inclusive and in many respects valid, not only in the production increases obtained, but in the recognition that the individual workman was the unit to be measured. The Gilbreths believed that the details of the work situation should be adjusted to the individual rather than the individual being forced into the pattern of the job. Their writings *(5, 6)* show much more insight and understanding of the individual than Taylor's work, and there is little evidence of the contempt for the workman which Taylor seems to have had.

One of the most interesting of the Gilbreths' contributions was the analysis and breakdown of a task into its basic elements of motion, which they called "therbligs." This word, which was invented by Frank Gilbreth as the result of a suggestion from his wife, can in some respects be considered as a forerunner of Serutan. Reading therblig backward gives the name Gilbreth except that the *t* and *h* are reversed. The therbligs are very useful; each has a name and a symbol, as shown in Fig. 21.

Every job involves a number of these therbligs. By way of illustration, consider signing one's name. A man usually keeps his fountain pen in his inside coat pocket. In therblig terms he must search, find, select (assuming he has more than one pen), transport loaded, position, disassemble, position, use, assemble, transfer, search, find, and position. A lot of work for such a simple task that is done in so short a time.



SYMBOL	NAME OF SYMBOL	SYMBOL	NAME OF SYMBOL
	Search		Disassemble
	Find	0	Inspect
→	Select		Pre-position
∩	Grasp		Release Load
	Transport Loaded	◡	Transport Empty
9	Position		Rest for Overcoming Fatigue
#	Assemble		Unavoidable Delay
U	Use		Avoidable Delay
			Plan

FIG. 21. Gilbreth's Therbligs. (From L. P. Alford, editor, *Management's Handbook,* copyright, 1924, The Ronald Press Company.)

After all the therbligs involved in the task have been identified, it is then necessary to ask six questions:

1. Is each therblig necessary?
2. Can the task be made simpler by having fewer motions?
3. Can there be less motion in performance or degree?
4. Can the steps be combined?
5. Can the sequence be changed?
6. Can more than one be done at the same time?

To go back to signing one's name, it is immediately obvious that a more efficient system would use a desk-set pen in a fixed position; this requires no assembling and disassembling and no selecting, and many of the other therbligs are not required.

Another simple illustration is the number of steps involved in inserting letters in envelopes and addressing and stamping them. A good exercise at this point would be to plan an efficient system. Remember that the introduction of equipment and machinery is not always desirable. An automatic stamping machine and addressograph might cost too much in relation to the average amount of mailing that is done by the typical small organization.

A good perspective on what has happened in the field of time and motion study since the early 1900's will be gained from F. W. Schumard's *A Primer of Time Study* (*14*). He writes, "It is believed that the make-up of a good time-study man is comprised of a percentage of 80%–20%. The 80% can be called contact, the other 20% can be called education and common sense." He then lists twenty-four inherent and acquired qualities of such men. Although Schumard is serious, he shows the nonsense that an industrial engineer can indulge in when he tries to play the role of a psychologist. So, by way of illustrating what *not* to do, his list is presented in Table 25.

TABLE 25. Twenty-Four Inherent and Acquired Qualities of Time Study Men[1]

1. Honesty
2. Personality
3. Imagination
4. Sense of fairness
5. Open-mindedness
6. Power of sympathy
7. Tact
8. Resourcefulness
9. Reliability
10. Self-control
11. Energy
12. Proper conduct
13. Self-confidence
14. Cooperation
15. Sense of responsibility
16. Observation
17. Analysis
18. Judgment
19. Accuracy
20. Planning ability
21. Power of instruction
22. Optimism
23. Salesmanship
24. Leadership

[1] By permission from *A Primer of Time Study*, by F. W. Schumard, Copyrighted, 1940, by The McGraw-Hill Book Co., Inc.

This list is open to criticism because these twenty-four traits do not define a time study man any more than they define a doctor, a dentist, an Indian Chief—or even a psychologist. Most likely any self-respecting person in any self-respecting job believes that these twenty-four traits are necessary in his specific job, too, and they probably are. Open-mindedness, power of sympathy, personality, courage, etc., are all desirable traits. But it is safe to assume that Schumard did not reach his conclusions as the result of tests and measures. The remainder of his book is a sound exposition of the slide rule, stop watch, wage scale, rest factor, and other items. Although it does give tips on how to make a time study, application of the method would run into the same difficulties that doom time and motion studies to failure. It does not take into consideration the most important item, the resistance factor, which is invariably encountered.

Mogensen (*12*) has a much more practical and valuable approach—the education of foremen and employees along lines that will encourage their becoming "motion-minded." He does not believe that the average worker is dull-witted but he admits that they sometimes lack enthusiasm. Mogensen encourages motion-mindedness in a plant by showing "before and after" motion pictures of work done with time and motion studies in other plants. He then trains the foreman and executives in some of the specifics of time and motion study; it is the executives' job to convince the workers that they will not be subjected to speed-ups or dismissal. In this manner the resentment that a time and motion study engineer usually encounters is avoided. It is to be emphasized that Mogensen's approach tends to overcome the three serious difficulties in time and motion studies. It avoids both the resistance to an outsider's initiating change and the insecurity-producing factors of time and motion studies, and it encourages an acceptance of change, since the workers themselves participate in and contribute to the change. The foreman and employees become involved in many of the intricacies of time and motion study. They construct process charts and make suggestions as to how to achieve greater efficiency.

As a consultant in this field, Mogensen has had considerable success with his method. It is exceedingly interesting to find William Gomberg of the International Ladies Garment Workers Union writing of the "evangelical activities of Allen Mogensen on behalf of the work-simplification movement."

It is a mistake to believe that time and motion study can be a tool of efficiency only for management. Labor through its unions can, and in rare cases, does, conduct time studies which result in benefits to its members. An outstanding illustration of this is the work that has been done by the I.L.G.W.U. under Gomberg's direction. The management engineering department of the I.L.G.W.U. was created to pursue two objectives (7):

1. To assist in improving the manufacturing techniques and operating methods of all branches of the industry with which our workers' earnings are intimately bound. This will be done through plant inspections by department representatives, followed by specific recommendations.
2. To serve as a central information agency:
   (a) To determine the level of "fair piece rates."
   (b) To record the production system and manufacturing techniques under which these rates are paid.
   (c) To assist in training shop members and committees in distinguishing bad time-study practices from good time-study practices in the determination of rates.

The union's primary concern, as reflected in its practices and behavior, is to use time studies for obtaining data so that it may bargain collectively with employers in establishing salary standards and piece rates. Its attitude toward these studies is generally thoughtful and critical. Gomberg regards them at the present time as, at best, an empirical guide to setting up a range within which collective bargaining on production rates can take place. He is very critical of the stop watch as a measuring device when one is striving for a reasonable range in accuracy of measurement, and he has data to prove the lack of reliability of such measurements. He questions that there is a single standardized method of performing a job and considers modification of method from worker to worker both desirable and efficient. Gomberg also recognizes a third limitation of time studies (*8*). "It is at once apparent that nothing has been developed in industrial time study practice that can be considered an objective measure of normality or an objective method for comparing operator performance with any normal standard."

The work of the I.L.G.W.U. management engineering department is primarily concerned with time rather than motion study. They are interested mostly in the setting of piece rates and they consider most motion studies to be primarily the concern of management. However, they do, on invitation from management, attempt to increase production in specific plants, and in these cases they are concerned not only with the setting of a fair piece rate but also with motion study.

Gomberg does not deny the usefulness of time studies, provided their limitations in accuracy, both as a measuring device and as a means of setting standards, are recognized. He believes that no alternative method of measuring or estimating a reasonable day's work has as yet appeared and that therefore time study methods and procedures must be called upon until a better technique is found.

One additional feature of this union's approach is the training of its members on the various shop committees in time study techniques. Sometimes these trained employees are accused by their fellow union members of not representing the workers' best interests, and yet they are backed by the union. This means that the technique, when applied fairly, allows for a reasonable settlement of claims rather than resulting in a one sided and emotional view Mogensen and this union both have faith in the training of workers in time and motion study techniques Regardless of

FIG 22 Worker s Suggestion Saves Production Time (By permission of General Electric Company)

one's opinion as to whether management alone, or in collaboration with labor, should set wage standards, there is no doubt but that employees can contribute to their own efficiency at least as much as the expert can, and in some cases more They need only training, an opportunity for expression and confidence that their improvements will be adopted. Fig. 22 shows one of the many ways in which management can recognize employee suggestions on how to increase production.

SOME SIMPLE PRINCIPLES

TIME and motion studies are not extremely technical or intricate; they are relatively simple to conduct provided one recognizes a few basic principles.

A very useful principle is that used in determining the most favored work area, sometimes known as the "semicircular work pit." Regardless of whether the employee is doing office work at a desk or assembling at a work bench, this principle can be applied. By circumscribing an arc with your right hand when your elbow is at the hip, and then with your left hand with elbow at hip, you will define a semicircle in which you can work with a minimum of moving and reaching. Then, keeping your back erect, swing your right arm to the left, and your left arm to the right, and you will define two other semicircles. These two overlapping areas determine a second, and larger, semicircle. This is the area wherein you can reach things with the minimum of stretching and body movement. Most work can be done in the first semicircle; but if necessary, it may be extended to the second one. This semicircular work pit is the most favored work area from the point of view of economy of motion and minimum effort.

The pre-positioning of tools, another simple principle, is a useful technique in time and motion studies. It avoids much unnecessary delay in looking for tools which have been misplaced. Pre-positioning operates effectively for a bankteller, a shipping clerk, a watch assembler, and for many other workers.

The prolonged holding of an object is poor motion practice. The introduction of a jig or a vise to clamp the work will free the holding hand. Most efficiency concepts encourage the use of two hands. Motion of the two hands is most efficient when they are used in opposite and symmetrical directions. Make slight circular movements with both hands, moving them both to the right as if you were tightening a light bulb in its socket. Then do it again, first moving both hands inward and then both outward. It makes a difference.

FIG. 23. Less Strain on the Back. (By permission of the McGraw-Hill Publishing Company)

The introduction of rhythm in work is also an important principle. Experienced carpenters, typists, and painters have rhythm in their work. In fact, a simple but crude manner of judging work performance and ability is to observe the worker on the job and watch for regular, smooth, and even movements. These encourage rhythm and indicate efficiency. The unsure, erratic, staccato movements of the novice can be detected immediately.

A drop delivery will prevent the cluttering of the work space and the waste of time involved in transferring of the finished product. A hole at the work place leading to a chute which carries the finished product away makes for efficiency and economy. Labor savings of from 5 to 10 per cent have often been accomplished by introducing a drop delivery system.

The redesigning of tools and equipment has been an accepted principle ever since Taylor redesigned the shovel.

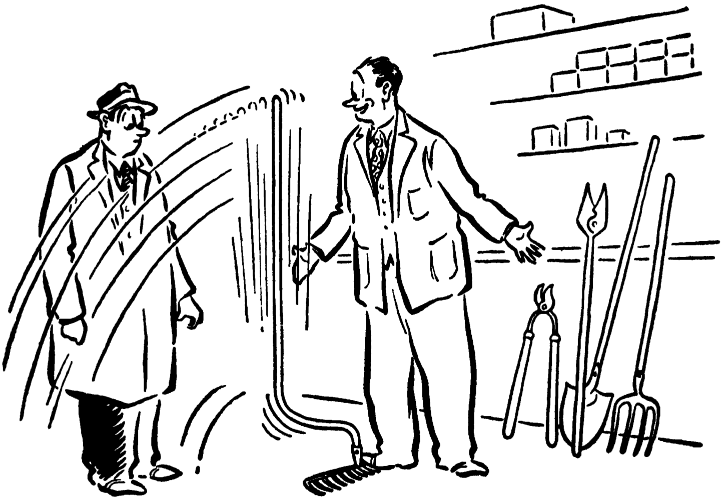


FIG. 24. Redesign of a Rake. (By permission of the *American Magazine*.)

The amateur gardener or farmer would find the new rake shown in Fig. 24 a welcome improvement.

The process chart is a desirable and not very technical device. A process chart records exactly what goes on. It may be a flow chart, which records the flow of work during the process. Or it may be a man-and-machine chart, which records the work of the machine in relation to the work of the man. A third type is the operator chart, which is mainly concerned with the separate work done by the left hand and the right hand. The cost chart, which establishes the cost of the operation, is a process chart that brings new happiness to the accountants in our society.

Another principle in time and motion study is the reduction of motion. Motions involving only the fingers are considered most efficient because they require least muscular effort. The least efficient motion is one which requires the use of the entire body. It is sometimes claimed that an attempt to reduce motions to such simple levels introduces monotony and related phenomena. Although, from the point of view of efficiency, this may be true in some instances, it must be conceded that the motion that involves the fewest muscles is the least fatiguing to the individual.

NEED FOR ALLOWANCES IN TIME AND MOTION STUDY

AFTER a time and motion study has been made, but before it is put into use as a standard of production or a basis for setting a wage rate, certain time allowances must be made for it. The four most commonly recognized allowances are (1) differences between the skill and effort of the worker on whom the study was based and the skill and effort of the group performing the task, (2) personal needs, (3) fatigue, (4) unavoidable delays. The first three are related to the human factor, the worker. The fourth is related to production and is largely independent of the worker. Because all machines occasionally break down and need repair, or material supplies may not be available, an allowance is made in connection with work which is determined solely by the motions and speed of a machine. The other three allowances must be made because of individual variability.

A psychologist recognizes the wide variations in human behavior, and when he develops norms he tries first to obtain data on large numbers of subjects. Most standards established as a result of time and motion studies are based upon the production of one, two, or possibly three people, but rarely more. Since the standard thus established will be applied to large numbers of people, the danger in drawing conclusions on the basis of such a limited sample is great. In fact, the weakness of the entire structure of time and motion study may be due to the fact that the sampling is so limited as to give invalid results. The time and motion study people partially recognize this difficulty and attempt to cope with it by making allowances part of their standard procedure. They realize that an individual's skill on the job will vary, as will his effort to produce. People with great skill may put forth little effort, and people with very little skill may exert great effort. The two other combinations—high skill and great effort, and low skill and little effort—are also possible.

In setting a standard, the time and motion study engineer basically and ultimately must use his own judgment as to the degree of skill and effort of the particular worker on whom he is basing the production standard in comparison with that of the other workers. This is a considerable responsibility and demands both skill and effort on his part. His judgment will be reasonable only to the extent to which he is concerned with this problem. By the same token, the extent to which he blindly follows the fashionable inefficient mathematical formula of the moment will determine the extent to which errors are possible. The Bedaux or speed-rating system attempts to solve the skill and effort problem in the manner just described. The writer is not fully convinced of the validity of the claims made for the Bedaux system despite its wide use in the past.

Factors which should be included in the allowances for personal needs are the employee's visits to the water cooler, locker room, and rest room or lavatory.

The allowance for fatigue, the third human factor, rests ultimately on sheer estimate. The problem of fatigue will be discussed more fully in Chapter 10, here we shall say only that susceptibility to fatigue is relative to the individual and that, in many instances, what is called fatigue is not fatigue at all.

The unavoidable-delay allowance is more easily reckoned. A time study expert can take up his post near a machine and record, over a day, a week, or several months, the time consumed by machine repair or by shortages of parts which prevent the employee from doing his work on the machine.

In a survey on the problem of time allowances in 360 plants in the Pittsburgh area, Blair (*2*) found that 106 of these plants used a stop watch or the time study method to set production standards. The remaining 254 set their standards on the basis of the judgment and experience of either a foreman, a pace-setter, or a worker who was assumed to be an average performer. In some instances, the standard set was based on the speed recommended by the manufacturer of the machine.

Most of the plants studied by Blair did not use a really objective basis for determining allowances, regardless of how they set the production standard. Extra time allowances were determined essentially by an over-all estimate of all four factors combined: skill-effort, personal needs, fatigue, and unavoidable delay. The general practice in the other plants was usually to overlook "allowances" completely.

A little-known book called *How to Run a Bassoon Factory* (*16*), a brilliant and delightfully humorous satire on American efficiency systems, presents the problem of allowances as follows:

> He [the time study man] proceeds something like this: (1) He sets a man to work on making a bassoon and times him to one hundredth of a second. This gives him a figure to work on; (2) He then takes his figure and applies the following reasoning (a) It took old Sam two days to make that bassoon, but he was not working as hard as he might, therefore, divide by two equals, one day; (b) Anyhow old Sam is old and not

> representative, therefore divide by two again equals one half day; (c) on the other hand, old Sam has had a lot of experience, therefore multiply by two equals one day; (d) but there were seventy-nine periods of two minutes where he did not do anything, therefore subtract one hundred fifty-eight minutes, equals five and a half hours. [In the United States five and a half hours equals three hundred and thirty minutes; however, the present author feels that he is not qualified to dispute the discrepancy in time.] (e) But he will get tired in the day so we'll allow him one half hour, therefore, add one half hour equals six hours; (f) on the other hand if the rate is to be tight old Sam will kick up a row therefore multiply by two equals one and a half days; (g) anyhow, we always leave a bit of margin, so let's call it two days. This is now made into a formula. The numerator is old Sam's time, times two, times two. The denominator is two times two equals (158 — 30 — 33⅓) and by taking old Sam's time and applying this formula we get the scientific determined time of two days. The time study man then works out what it usually pays old Sam, for work, and there you are. This, however, is piece rate in its simplest form. If you particularly wish to acknowledge the worker, it is usual to say that you will pay him seven pence a bassoon for the first ninety bassoons and with each subsequent bassoon 6/90 of a penny. Thus the more he does the more he gets paid but not so much, if you see what I mean, then he strikes and you arbitrate and begin again. The majority of strikes about wages are the result of the worker being unable to appreciate an ordinary logical piece of reasoning like this.

Of course the fictitious Mark Spade is spoofing; but to anyone with a sense of humor some of the rationalizations made in connection with extra time allowances will appear to be little better. These allowances are a serious pitfall in time and motion studies; they should not be overlooked or speedily estimated. They should be based on actual data from a large sample of workers and not from just one or two employees. Foremen, pace-setters, or an expert's estimate of the average worker do not provide a sound or scientific basis for determining extra time allowances in time and motion studies.

TIME AND MOTION STUDY IN THE HOME

It must be emphasized that time and motion studies are not merely a concern of big business and big unions. The application of these studies has also resulted in increased efficiency in the home. Marvin E. Mundel and Janet Armstrong (*13*) have done much work in applying the findings of these studies in the home. They recommend six rules of efficiency:

1. Eliminate all unnecessary parts of a job. For example, in dishwashing, use very hot water and let the dishes drain dry; do not wipe them.
2. Keep everything within easy reach, i.e., the coffee pot, coffee can, and measuring spoon should be stored close together in a cabinet.
3. Use the best tool for the job. For instance, use a step-on can with a removable inner sack for garbage.
4. Use both hands for such work as putting away dishes or stacking fresh linens.
5. Combine two jobs into one; for example, fold pillow cases with the free hand as they are ironed.
6. Whenever possible, sit down to work—when preparing vegetables or feeding the children, etc.

These six rules for efficiency in the home are similar to the rules regarding efficiency in industry. Housewives and their husbands are not likely to object to new methods which will make housework less of a burden. By the same token, employees are not likely to object to efficiency methods which make their jobs less of a burden, providing they are not subjected to a speed-up or made to feel their position is insecure. Any small office, shop, or factory can improve its efficiency tremendously by applying the principles recommended here.

EXAMPLES OF CONTINUED INEFFICIENCIES

Two popular and widely used machines in the present era are notoriously inefficient—the typewriter and the sewing machine. The typewriter now in use makes it necessary for the left hand to do 57 per cent of the work. August Dvorak has rearranged the keyboard so that the right hand does 56 per cent of the work. This keyboard makes it possible for trained typists to do between 165 and 180 words a minute. Its arrangement is as follows:

7 5 3 1 9 0 2 4 6 8
? , . P Y F G C R L /
A O E U I D H T N S -
, Q J K X B M W V Z

Another widely used inefficient machine is the sewing machine. The present electric machine requires that the left hand, which is ordinarily less agile, do more work than the right. This is the case not because the machine was designed by a left-handed person, but because originally the right hand did the important work of starting and stopping the machine as well as regulating the wheel. In the electric sewing machines the right hand is relieved of this task. The present position of the needle head at the left does not allow the right hand to feed conveniently the material to be sewed. Turning the machine around would most likely result in greater accuracy and speed of operation. However, this will probably not be done, nor will the Dvorak typewriter keyboard gain immediate popular acceptance. This can be understood, primarily, in terms of resistance to change. It must, however, be added that although the use of the present typewriter and sewing machine may be irrational in terms of ultimate efficiency, it is rational to the individual employer who has a capital investment in these machines. It is also rational to individual operators who can use the present machines but would have to learn to operate a new, even though more efficient, machine.

BREAKING RESISTANCE

ONE of the simplest aids in breaking a person's resistance to change is to ask him to write his full name, leaving out every other letter. After the signal "Go," time him accurately with a stop watch; then without any comment, ask him to write his full name in his usual manner, and time him. The results will show that writing the name, using only half the letters, takes just as long as writing the full name, and sometimes longer. Tell him the length of time it took to do both tasks. Of course, he will object. Usually people say, "But I am used to writing my full name, and writing just every other letter required effort!" You then counter with, "Yes, you are used to doing the job in one way, but won't you admit that a short amount of practice will probably result in your signing your name in approximately half the time?" Most people will accept this, and you continue, "Then you may admit that doing your job this new way will, with practice, eventually require less effort and time."

Another simple means which can be used to break resistance to change is to ask a male employee to describe in detail how he puts on his suit coat. Then ask him to put on his jacket and call his attention to the discrepancy (there usually is one) between his description of an often-performed task and the actual performance. Time him while he is putting the coat on. Then ask him to take it off and put it on again, but this time have him start with his right hand rather than his left. Many people experience considerable difficulty with the left-hand right-hand reversal, but it serves to drive home the point that new tasks or operations are sometimes judged more difficult solely because they are new, and not because they are more difficult.

SUMMARY

TIME and motion studies are used to establish a method for performing a task with fewer and simpler motions and in less time. Unless the psychological aspects of these studies are considered, they are likely to meet with considerable resistance on the part of employees and ultimately to fail. The three major employee objections to time and motion studies are: dislike of new things, resistance to changes initiated by outsiders, and the unwarranted speed-ups, cuts in production rates, and related job insecurity which have resulted from the misuse of these studies.

The first person to introduce efficiency studies was Taylor, who increased production considerably by the introduction of rest pauses and controlled work via close supervision. The Gilbreths, who followed, placed their major emphasis on motion analysis. In addition, they recognized that man was not a mere machine but a human being with definite psychological qualities which had to be considered. Mogensen's approach is considered the most useful by the present author, and probably the one with the greatest chance of success. Mogensen recognizes the dangers of and the accompanying resistance to the initiation of change by outsiders, as well as the chances for misapplications. His system of time and motion study is based primarily on training employees and foremen and on encouraging their becoming "motion-minded."

The fact that time and motion studies are not solely a tool of management but may also be used by labor unions has been demonstrated by their successful application by the International Ladies Garment Workers Union especially in setting piece rates and negotiating wage rates with management.

Time and motion studies need not be the technical and intricate affairs which most people believe they are. Process charts, the semicircular work pit, the drop delivery, the pre-positioning of tools, the classification of motions, and the introduction of rhythm in work are relatively simple techniques which are of the essence of these studies.

The estimation of time allowances is a major difficulty in time and motion studies. The errors in these estimations present so serious a problem that it tends to weaken the entire structure of the technique. The four usual time allowances are those for: (1) differences between skill and effort, (2) unavoidable delay, (3) personal needs, and (4) fatigue.

Time and motion studies are applicable not only in large industrial organizations, but also in small factories, offices, and the home, with equal success. However, the introduction of new work methods will meet with resistance, but there are simple, relatively successful ways of overcoming this resistance.

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10. Fatigue and Related Phenomena

FATIGUE is a subject that interests both the employer and the employee. Since a decline in the curve of production is often attributed to the worker's fatigue, the employer would like to eliminate this decline by eliminating fatigue. The employee recognizes fatigue as a feeling of tiredness or pain; he regards it as intrinsically unpleasant, and so he too is interested in its decrease or elimination. For these reasons, industrial fatigue, despite its elusive nature, has been the subject of many investigations, from both a physiological and a psychological point of view. Many topics in industrial psychology are directly or indirectly concerned with fatigue. One of the goals of time and motion study is to reduce the effects of fatigue in workers by introducing more efficient work methods. Evidence indicates that proper training results in correct work methods which can do much to prevent the onset of fatigue. It is also recognized that effective motivation can be successful in eliminating fatigue or at least in reducing its effects. A relationship has been found between accident rate and fatigue.

The word fatigue is widely used and misused. Practically all physiologists and psychologists recognize the diverse factors involved in this concept. Sometimes fatigue of a physical nature is differentiated from fatigue of a psychological nature. This leads to the use of the term "fatigue" as differentiated from the term "mental fatigue." Monotony, boredom, and other similar phenomena in industry are in some respects similar to fatigue, at least as far as reduced production is concerned. Although such terms are sufficiently different so that anyone knows in personal situations when he is fatigued or tired as compared with being bored, in industrial situations there is often confusion between these two concepts. The industrial psychologist studies fatigue not so much to understand its physiological basis as to be able to eliminate as many of its effects as possible, and thereby maintain or increase production and job satisfaction.

FATIGUE: WHAT IS IT?

INVESTIGATORS working in this area are in general disagreement as to the nature of fatigue, and many are perplexed by the diverse character of the concept. According to Dill (*6*):

> We can say that fatigue is not an entity but merely a convenient word to describe a variety of phenomena. The common fallacy of supposing that the word fatigue corresponds to a definite thing has been a source of much confusion. Fatigue from short bursts of activity whether by the whole body or by isolated muscular groups, is characterized by increase in lactic acid and temporary inability to continue. Fatigue from depletion of fuel reserves does not occur commonly in man, but when it does, chemical analysis of the blood reveals a low level of blood sugar. Fatigue from working in a hot environment has several manifestations, the most simple to measure being the increase in heart rate. Finally in the instance of two individuals doing the same task, one may become more fatigued than the other because the poor nervous coordination of the unskillful man makes it necessary for him to expend more energy than the other. In general, fatigue from any of these causes is greater the more nearly the individual approaches his capacity for work.

In an intensive study called *Fatigue and Hours of*

Service of Interstate Truck Drivers (*7*), the term fatigue is defined as an altered psychological and physiological state in relation to the status of recovery or normal capacity. Muscio (*16*) defines fatigue as "a condition caused by activity in which output produced by that activity tends to be relatively poor and the degree of fatigue tends to vary directly with the poorness of output." Muscio, however, is himself dissatisfied with this definition because fatigue cannot be directly measured and because diminished output may also be a result of distraction. He concludes that the term fatigue should be banished from scientific terminology. But banning the word would still leave the phenomenon that by any other name would still be fatigue. It would be pointless to argue with a fatigued worker that there is no such thing as fatigue because fatigue does not stand the rigors of scientific tests and standards.

Whatever fatigue is, it is safe to say that any muscular work, even that involved in sitting in a chair, will result in fatigue provided the work of the muscles and the resulting expenditure of energy are at a faster rate than recovery is. The major difficulty in understanding the true nature of fatigue is caused by the fact that many factors in addition to muscle use contribute to its onset. The length of the work period, the speed of work, the extent of the musculature involved, and the tensions accompanying the task are a few of these factors. Further complications are caused by the fact that industrial fatigue rarely ever concerns a single muscle but rather the individual as a whole. Depending on the strength, stamina, and preparation of the individual, fatigue is manifested at different rates in different people.

In some respects no one can ever hope to eliminate fatigue from work unless the work can proceed at the exact rate at which recovery takes place and all the other factors contributing to fatigue can be eliminated. And yet some people set their pace on the job so that recovery seems to take place faster than the onset of fatigue. Half seriously, this might explain the stenographer who comes to work in the morning very fatigued but somehow manages to gain energy during the day so that she is able to keep her date in the evening, only to be fatigued the next morning. This must not be regarded as fatigue; it is a phenomenon related to fatigue that will be discussed later in this chapter.

Psychologists can help to eliminate much of the unnecessary fatigue that is caused by unfavorable conditions on the job. Inefficient work spaces, inefficient work methods, inefficient tools, and inefficient people to do the work cause much unnecessary fatigue. These causes can be attacked and conditions changed so as to eliminate or reduce much fatigue on the job.

A simple approach to an understanding of fatigue has been the study of it in the laboratory. An early study of this nature was conducted by Mosso (*15*) in 1890. He constructed an ergograph to record and measure the work done by the muscles in flexing a finger. By attaching a weight to a string tied to a finger and strapping the hand so that only this finger was allowed to move, it was possible to obtain a sample work or fatigue curve. Using this technique, Mosso demonstrated the rate and extent of the work that could be done by a single finger lifting a specific weight. He was also able to demonstrate that if a fatigued muscle is forced to work, the period of recovery is prolonged. Thus if a few minutes is required for recovery after a ten-minute work period but the work period is nevertheless increased to fifteen minutes, recovery requires more than one and a half times the time required after the ten-minute work period. Although Mosso's ergograph does study fatigue, it has the obvious disadvantage of doing so under extremely unnatural conditions; furthermore, no job in industry is likely to require the movement of only one finger.

Vernon (*21*) developed a variation of the dynamometer which enables one to study the effects of work when the larger muscles of the body are involved. His apparatus requires the subject to pull with both hands on a handle attached to a spring balance; the pull on the balance is recorded by a pointer on a revolving drum. With this apparatus Vernon was able to show that the strength of the pull varies with the height of the handle. He also demonstrated that the introduction of rest pauses increases the capacity for work, and further, that a change of posture during the rest pauses helps recovery to a greater extent than merely stopping work. Vernon's study has a more direct bearing on various industrial jobs and is a strong argument in favor of introducing rest pauses during the work period. It also recognizes the benefits to be derived from encouraging employees to change their posture from that normal during the work period. Many other studies of a similar nature have been made in the laboratory, but each has the disadvantage that the subject is not actually working on a job. Inferences drawn from the laboratory studies may not apply to industry because differences in work speed, pace, and continuity may exist.

INDUSTRIAL STUDIES OF FATIGUE

CROWDEN (*5*) classifies muscular work in industry into three general types. The first is heavy muscular work that is too strenuous for a steady continuous rate of work to be maintained. Examples of this type of work are loading trucks, building roads, and possibly mining coal. The second consists of moderately heavy work that is continuous and in which the rate of expenditure of effort is much lower than in the first type and is somewhat balanced by the rate of recovery. Examples of this type of work include machine tending and many other kinds of factory work. The third type of muscular work in industry is the light, speed work which involves a relatively small expenditure of energy but which often requires a postural strain that causes unnecessary fatigue. Office work is a typical example.

Crowden found that in a fifty-yard barrow run the worker expends approximately 8 per cent of his energy in raising and lowering the handles, 22 per cent in attaining a wheeling speed and in stopping, and the remaining 70 per cent in the run itself. This study shows the tremendous inefficiencies that would result from interfering with the run once it is started. In studying the energy cost of moderately heavy work, Bedale (2) found that carrying a load with a yoke as a milkmaid does is the most economical method from the point of view of expenditure of bodily energy. Any method of carrying weights which requires postural strain and displacement of the body when walking is more costly. Crowden reports that light, speed work involves little expenditure of energy but that there may be considerable fatigue because of the cramped or uncomfortable position maintained by the worker. Measurement of the actual expenditure of energy does not give a measure of fatigue with Crowden's method because his measures basically the oxygen consumption in excess of normal.

The tremendous difficulty of the problem of fatigue is vividly illustrated by the research on the relationship between fatigue and hours of work of interstate truck drivers done by the United States Public Health Service in one of the most valuable studies in this field. The purposes of this study were (1) to determine if various periods of truck driving would produce demonstrable and significant psychophysiological changes; (2) to investigate the nature of these changes; and (3) to discover whether a characteristic pattern of psychophysiological response occurs after long hours of driving, i.e., the syndrome "drivers' fatigue."

The sixteen factors which were considered as contributing to fatigue in truck drivers were:

1. Performance of a skilled operation requiring a high degree of alterness and attention.
2. Nervous strain due to driving under adverse conditions.
3. Muscular exertion in loading and unloading and in the repair and maintenance of vehicles.
4. General irregularity of habits as a result of long-distance hauls.
5. Failure to obtain satisfactory rest or sleep during rest periods or when off duty.
6. Physical condition.
7. Constant use of the eyes, frequently under unfavorable conditions such as glare, etc.
8. Social factors in the environment or occupational tradition possibly promoted by enforced absence from home.
9. Monotony inducing sleepiness.
10. The consumption of coffee and alcohol.
11. Exposure to all types of weather conditions.
12. Exposure to toxic fumes and gases.
13. Economic insecurity, that is, fear of losing one's job especially in the case of older men.
14. Noises.
15. Vibration.
16. Sedentary occupation—the effect of posture.

In this study a total of 889 drivers in three cities—Baltimore, Nashville, and Chicago—were given a comprehensive battery of tests. The investigators took no sides in the controversy as to which type of test best measured fatigue, but used both simple and complex performance tests, and also included non-performance tests in their battery.

Whereas performance tests measure ability to do a given task, non-performance tests measure bodily states over which the subject has little or no voluntary control. An impartial observer will readily concede that each of the two types of test used in the measurement of fatigue has its advantages and disadvantages, and that both should be used. However, they have been the subject of considerable debate among those attempting to measure fatigue. One of the advantages of a performance test is that it directly measures a function in relation to the specific task —hand steadiness, for example. Another is that it can detect relatively slight degrees of fatigue more rapidly than most non-performance tests. The disadvantage of performance tests is that they can be influenced by the motivation and attitude of the subject.

The advantage of using a non-performance test is that it is based entirely on chemical and physical changes which, in most cases, cannot be brought about deliberately by the subject. The disadvantage is that emotional states which have nothing to do with fatigue may, in certain instances, cause similar chemical and physical changes and so the test may measure not fatigue but an undetermined emotional state.

The complete battery included the following:

I. Psychological tests.
  1. Spatial perception (the estimation of known sizes).
  2. Manual steadiness.
  3. Precision of movement (aiming).
  4. Reaction-coordination time.
  5. Reaction time.
  6. Speed of tapping and work decrement.
  7. Strength of grip.
  8. Static equilibrium (postural steadiness).

II. A series of tests using the De Silva driver vigilance test apparatus, consisting of accelerator-brake-foot reaction time, steering efficiency, and a combination of starting efficiency plus brake reaction (this apparatus is described more fully in Chapter 12).

III. Tests to measure resistance to and recovery from glare.
IV. Tests to measure the speed of eye movement.
V. Tests to determine the critical fusion frequency following exposure of the eye to flicker at two levels of illumination.
VI. Snap acuity test.
VII. White blood cell count.
VIII. Concentration of potassium and total base in blood serum.
IX. Determination of carbon monoxide content of blood.

In addition to these tests, a thorough medical examination was given. Also included in the data was an occupational and habit study of the drivers.

The major findings of this study do not present the clear-cut conclusive evidence that one would like; but there is no real reason to believe that such information can be forthcoming with the measures of fatigue that are known at the present time. The investigators state, "It appears that a reasonable limitation of hours of service of interstate truck drivers would reduce the number of drivers on the road with low functional efficiency. This, it might reasonably be inferred, would act in the interest of highway safety." The test results showed that the men who had not been driving just prior to being tested had the highest average efficiency, those who had driven less than ten hours had the next highest average efficiency, and those who had driven over ten hours had the lowest average efficiency, in the following seven functions:

1. Speed of tapping.
2. Reaction-coordination time.

3. Simple reaction time.
4. Manual steadiness.
5. Body sway.
6. Driving vigilance.
7. Ability to distinguish flicker.

The men who had been driving prior to being tested performed less efficiently on the average than those who had not driven, on tests of the following three functions: (1) aiming, (2) resistance to glare, (3) speed of eye movement. The data on these three tests, however, do not differentiate consistently between drivers who worked from one to ten hours and those who worked over ten hours. In Items 1–7 this difference does occur. Heart rate decreased slightly with hours of driving. The average white cell count was higher in men who had driven than in men who had not driven since sleeping. No relationships were found between hours of driving and ability to estimate the size of known objects, differential white cell counts, hemoglobin content of the blood, acidity of urine, specific gravity of urine, visual acuity, and the total base and potassium concentration of blood serum.

There was a relationship between the men's subjective estimate of fatigue and the objective measure provided by some of the tests.

RELATED PHENOMENA

IF FATIGUE is regarded as elusive and difficult to measure, mental fatigue must be regarded as much more so. After preparing a lengthy assignment, college students often insist that they cannot possibly read another page; they are exhausted and must go to bed. If, at that particular moment, the telephone rings and an attractive date is in the offing, the fatigue caused by this "strenuous" mental activity goes out the door with the student. The question is: Was there any mental fatigue in the first place?

Mrs. Gilbreth said in a recent speech that girls with dates suffer less from fatigue than girls that have no dates. It is not necessary to wax philosophical in a book on industrial psychology, but mental fatigue implies that such "stuff" exists, apart and distinct from the physiological realm. This, according to present-day science, cannot be taken too seriously. Undoubtedly, the major component of mental fatigue is attitudinal; the physiological component is surely not sufficient to resemble the fatigue measured by available performance or non-performance tests.

In an experiment on mental fatigue (*10*), three subjects worked for a twelve-hour period on four successive days multiplying four-place numbers by four-place numbers. Each problem was solved without the aid of pencil and paper and only the answer was recorded. If anything should cause mental fatigue and even a certain amount of physical fatigue, an experiment such as this should have produced it. However, little evidence to support this was uncovered. Even though the subjects had had extensive practice prior to beginning the experiment, all three showed an increase of speed in mentally multiplying four-place numbers. It was found that the effect of continued mental work was associated with an increase in the percentage of error. One subject scored 38 correct answers out of 80 on the first day, and 33 correct out of 115 on the fourth day. The other two gave similar results. The work curves for all three subjects (Fig. 25) are relatively flat and do not show the theoretical characteristics of either fatigue or monotony curves.

"Despite conclusive, objective evidence that feelings of intense dislike, ennui, boredom to the extent of headache and illness, dizziness, nervous instability and physical and muscular weariness were accompanied by some decrease in mental efficiency, one would not venture a guess as to what extent the decrease was attributable to divided attention or to mental fatigue per se."

In addition to this rigorous mental task the subjects took

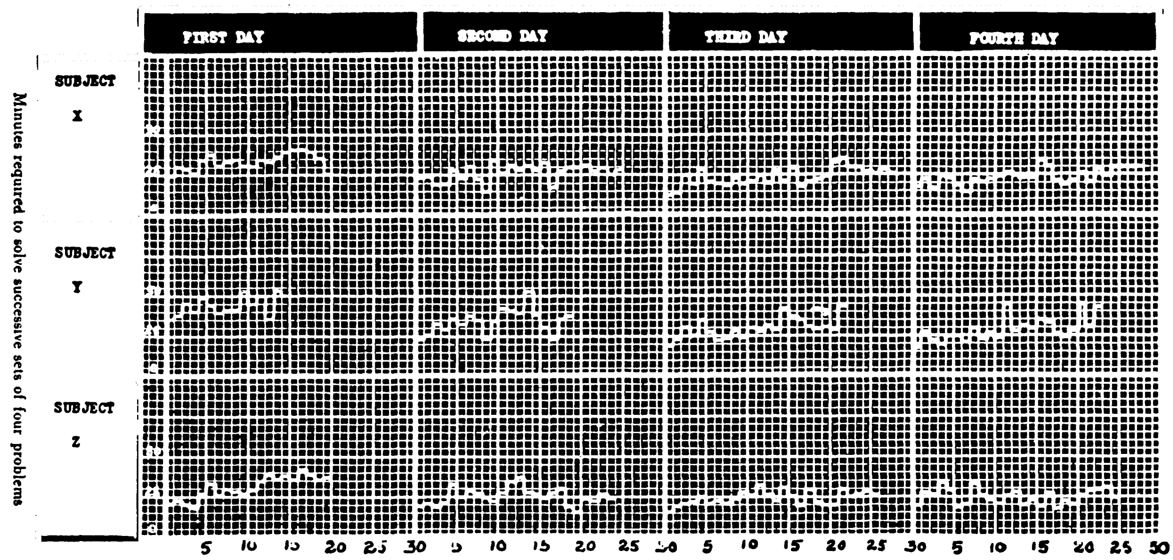

FIG. 25 Work Curves of Subjects Performing a Difficult Mental Task. (From *Psychological Monographs;* used by permission of the American Psychological Association.)

a battery of psychological tests before and after the twelve-hour multiplication period. The results of these tests were not consistent. For example, at the close of the first day all three subjects made lower scores after the twelve-hour period of mental work; this suggests the possibility of "transferred fatigue." But on the second day all three made slightly higher scores after the ordeal, and on the third day the results were erratic and contradictory. With reference to the non-performance tests, all three subjects displayed few conclusive signs of unusual physical fatigue as revealed in measures of abdominal and costal respiratory movements, metabolic rate, pulse, temperature, weight, recording of blood content, and urine analysis. The authors conclude: "Despite subjective states of physical fatigue and overwrought nerves recognized by all three subjects, the records showed little indication of physical fatigue except for the rise of metabolic rates during the third and fourth days of the fatigue series. Even these metabolic rates had returned to normal on the morning of the day following the experiment." The notes of one of the subjects best summarize the subjective results. She wrote, "Isolation, hard work, etc., made entire four days seem like one long nightmare to me. I marvelled that the other two girls seemed to hold up so well. Would not repeat these four days for ten thousand dollars, I believe."

This experiment and its findings, like others which have been conducted, must create considerable doubt as to the existence of mental fatigue as an entity. As a feeling, it undoubtedly exists. However, no physiological changes take place during mental fatigue and psychological measures of performance do not show any decrement. Performance of a mental task is not materially lowered. In other words, fatigue resulting from mental tasks can be considered nil.

Possibly the largest single component of mental fatigue is the tension which usually accompanies a task that an individual regards as a challenge. Writing an examination paper for three hours, were no tensions involved, would be no more fatiguing than writing a letter to a friend. Tension is not only a psychological but also a physical entity. A person can continue extremely difficult mental tasks without any dire effects much longer than is ordinarily believed. The Huxtable experiment clearly illustrates this point.

Another phenomenon related to fatigue is monotony or boredom. The outstanding characteristic of monotony is the fact that it is dependent upon the individual rather than the job. The girls assembling relays in the Hawthorne Studies showed little evidence of monotony despite the extremely repetitive nature of their job. A story is told about a champion orange packer—in other versions it is an electric bulb packer or someone else. (Chances are it never happened, but it illustrates the point.) In a certain state a contest was held to determine the fastest orange packer. He was to be designated "king" or "champion" with much fanfare. After a series of preliminaries, quarter finals, and semi-finals, the final was held and the champion selected. This man worked at a fast, steady, almost furious pace. But of course he finally stopped work long enough to be interviewed and he supposedly reported that he found the job very challenging. For one thing, he did not regard oranges as all alike; they differed in size, color, and texture. Furthermore, when he saw an empty crate in front of him, he had a strong desire to fill the emptiness by putting in the first layer as rapidly as possible. When this layer was finished, the motivation was strong to complete the second layer and finally the last, so that the crate could be taken away and a new one brought to him. To this person, if he ever existed, orange packing is not a monotonous job.

In determining whether a job will be regarded as monotonous by an individual, his intelligence, his interests, and his personality must be investigated. People who are too intelligent or not intelligent enough for a certain job often find it monotonous. Those who would rather work with other people find a job in which they work with things monotonous; conversely, a person who would rather work with things dreads the thought of dealing with people. Interest in an occupation or profession enables one to find challenging situations in it which a disinterested person could never find or understand. Occasionally the author meets former students of his who, after the usual exchange of niceties, often ask, "Are you still teaching?" And, next, "Are you still teaching the same course?" To the author, each semester and each section presents a very different problem and so teaching is not quite as monotonous for him as these former students seem to believe.

Much has been written about the effect of specialization and simplification of work. People are supposed to prefer varied rather than uniform or repetitive tasks. This is not true to the extent that is ordinarily believed. The average individual gives lip service to the importance of and need for variation in work and life in general but merrily performs as many tasks as possible in a routine fashion. For example, people who ride on the subway in New York City have little need to travel on the same train each morning, since trains are likely to run just a few minutes apart. Yet many people who claim they desire variability in their work walk to the station by exactly the same route and enter the same door of the same car, day in and day out. People are likely to eat in the same restaurant every day; many prefer to sit at the same table each time. Examples of the desire and preference for uniformity of tasks are endless. Many people prefer a job with a minimum of responsibility. Jobs that are varied sometimes require decisions that may get the person into trouble, whereas routine jobs are "safe" jobs. For some people, a uniform task is a boon and not a boomerang. The only job that is monotonous is the one which the worker who does it regards as monotonous and this is true regardless of the occupational level.

As we saw earlier, fatigue, assuming that it does exist in industry, can be reduced by shortening the working day, by introducing rest pauses, and by providing more efficient environmental factors on the job. Monotony can be reduced by a more careful selection of personnel—by attempting to hire the person with the necessary intelligence for the job, and rejecting those with too much or too little. Consideration of the job in relation to the personality of the individual often makes for a situation in which there is no clash between the individual and his tasks.

Just as rest pauses reduce fatigue, so are they useful in reducing monotony. A rest pause often provides a necessary break in activity and just the change the worker needs to combat monotony.

From the point of view of reducing monotony, job changing is important. Employees very often change jobs, even against company rules, in order to combat monotony. Good supervision demands that such changes be noted, studied, and possibly encouraged. In many cases the rule against changing jobs is the result of an incomplete definition of efficiency in the first place. Many jobs can be made more interesting provided meaning is attached to the work. By this we do not mean assuming a "Pollyanna" attitude and attempting to create meaning where no meaning exists; workers are too smart for these tactics. However, explaining to the worker what his task is in relation to the organization as a whole often gives him a sense of the meaning of his job that he could not have gained by himself.

Another way to combat monotony is to provide social and recreational activities. Some organizations carry this to such an extreme that a man's job sometimes seems merely a fill-in between one bowling contest and the next.

However, there is no doubt that many workers look forward to the few minutes they can spend in the canteen smoking, talking, and drinking soda.

HOURS OF WORK AND PRODUCTION

THE crux of the problem in industry is not really the presence of fatigue or monotony but the relationship between an employee's hours of work and his production. There is widespread misunderstanding and confusion about this relationship. It is generally believed that the way to increase production is to increase the number of working hours. During periods of unemployment it is widely believed that the way to spread employment is to shorten the work week. Both these views are "common sense"—and faulty. Stated most simply, increasing the hours of work usually decreases production. The corollary is also true—decreasing the hours of work usually increases production.

As we all know, a tremendous increase in production occurred during the war years. This increase developed in spite of the increased hours of work, rather than because of it. The real problem is not the number of hours of work in relation to production, but the relationship between the real and the nominal hours worked. The length of the working day has become an emotional problem. Unions have used a shorter workday as an indirect means of increasing wages. Some businessmen have expressed great concern over what the employee will do with this new leisure time; others believe that a shorter workday will force them out of business. Both groups tend to overlook the important point—how many hours a person actually works during the workday. Very often, a decrease in the nominal hours of work does not in any way affect the actual hours worked. Nominal hours are defined as those between punching "in" and "out" on the time clock. There is a difference between these hours and the actual hours worked; any employer or employee knows this. Unproductive working time, rest pauses, tardiness, early stoppages, absenteeism, changes in work pace must all be considered. It is these factors, as well as others, which create the discrepancy between the nominal and the actual hours of work.

It is a fact that as nominal hours increase, the proportion of actual hours worked to nominal hours decreases, and that as nominal hours decrease, the proportion of actual hours to nominal hours increases. This principle must be remembered, for not until it receives the proper attention will much erroneous thinking be prevented. Rex Knight (*12*) reports a number of typical illustrations of this principle. In one instance when nominal hours were reduced from 63¼ to 54, actual hours fell only from 56 to 51. In another case, when nominal hours were reduced from 62.8 to 56.5, actual hours rose from 50.5 to 51.2. In a third case, the amount of time lost through sickness was 2.8 per cent of a 46-hour week. This rose to 3.85 per cent when the nominal hours were increased to 54, but dropped to 2.7 per cent when the hours were reduced to 46. In still another study reported by Knight, the nominal hours were reduced from 74½ to 63½ and the actual hours fell from 66 to 64.4. However, since the hourly output increased by 21 per cent, the total output remained unchanged. The reduction of nominal hours continued and finally there was an increase of 13 per cent in weekly output, although the actual hours had been reduced 18½ hours.

In one other study, 2⅔ hours overtime was added to the normal 10-hour day. The hourly output fell by 6.5 per cent on the day overtime was worked, and 3.9 per cent on the following day.

A survey made by the U. S Department of Labor (*9*) in twelve metal-working plants found that the 40-hour week and the 8-hour day yield the highest output for each hour worked. More than 40 or 48 hours a week resulted in additional output but with constantly decreasing efficiency and with increasing absenteeism as the hours were stepped up.

Employees doing light work under wage incentive systems and with weekly schedules ranging between 55 and 58 hours have achieved the equivalent of approximately two hours' output for every three hours worked over 48. On heavy work, the ratio was more nearly one hour's output for every additional two hours' work. This survey also gathered data indicating that the 7-day week as a steady program is uneconomical and may actually result in lower production than the 6-day week.

The primary effect of lengthening the workday for employees working a 5-day week is to wipe out the mid-week spurt in production. Analysis of daily production records in several plants on a 40 to 48-hour schedule shows a building up of hourly efficiencies toward a peak on the third or fourth day of the week, and a slight drop thereafter. When the workday was lengthened to 9½ hours or more, this peak disappeared. The data indicate clearly that workers adjust themselves to a longer workday by slowing down.

This study also found that when a sixth workday was added to bring the work week up to 58 or 60 hours, the result was likely to be a steady decline in the efficiency level every day, with the peak points occurring on Monday or Tuesday, that is, at the beginning of the week.

The 6-hour workday unbroken by a lunch hour but with a slight interval for refreshments is not an industrial impossibility. A study reported by the U. S Department of Labor (*20*) describes the experiences of a factory which changed from three 8-hour shifts to four 6-hour shifts. This led to a reduction in earnings for most employees. Four hundred and twenty women were interviewed. Of this number, 265 had worked under both systems and 77 per cent of this group preferred the 6-hour shift because it gave them "more time for the home," "more leisure," and "less fatigue."

During the war, when many people were concerned with the optimal work week from the point of view of maximum production, the Industrial Relations Section of Princeton University canvassed a group of key industrial relations executives in representative companies throughout the country. The prevailing judgment of these executives (*17*) was that the 8-hour day and 48-hour week constituted the best schedule for sustained production in our war industries. This study gathered striking evidence which indicated that a work week of more than 48 hours, and particularly over 54, resulted in a reduction in individual output and an increase in the number of days missed from work. The effects of the long hours piled up slowly and did not become evident in the first few weeks under the extended schedules. The survey also found that an increase in the number of days worked per week from 5 to 6 seemed to have less effect on productivity than an increase in hours per day.

The increase in absences with the 8-hour day and 6-day week is probably due more to a desire for leisure or recreation than to the accumulation of physical fatigue. Women in particular want time off on a weekday for shopping and household duties; they probably achieve their best performance in a 5½-day week, even if it entails longer daily hours.

Some years ago, when the employees of a large department store in New York City returned to work after a strike, they voted 822 to 97 for shorter hours with the same pay. The settlement plan they voted for called for a 5-day 40-hour week; they turned down a 5½-day 42-hour week with a weekly wage rise of $1.50. In other words, employees who do not earn too much money in the first place prefer a 5-day week to a 5½-day week.

The question of nominal hours in relation to actual hours of work should not be an emotional issue but rather a subject calling for careful study of the available facts.

Most of the published material in the field indicates that shortening the work week does not necessarily interfere with total production; in fact it may serve to increase total production.

Furthermore, this material indicates that overtime results in inefficiency. With the general practice of paying for overtime at 1½ to twice the normal rate, the cost of production must mount even higher when it is recognized that production during the overtime period is less than it is during the normal workday. Moreover, overtime has been found to lower production both the day the overtime occurs and on the following day. A worker consciously or unconsciously paces himself when he knows he must put in extra hours that day. Telling employees, without warning, that they are expected to work overtime creates dissatisfaction. On the other hand, if the announcement is made a day in advance, there is usually an increase in absenteeism. No matter how one looks at it, overtime means an increase in the hourly working week and often serves little purpose, although the employee may not object to it because it affords him an opportunity to earn more money. In a study conducted over a three-year period (*18*), Scheidt reported that a 6-hour day raised employee efficiency from 15 to 30 per cent above what it was for an 8-hour day that includes two hours of overtime. The employees were 17 women who set type by machine and 52 men who set it by hand. Overtime is not recommended as a means of increasing production, unless it is infrequent and on a volunteer basis.

THE ULTIMATE WORK WEEK

IN VIEW of the current trend in the work week, it appears safe to say that we are on the brink of the 30- or 35-hour week. This work week, with our present means of production, is entirely within the realm of possibility. It is to be hoped that the decision to adopt this work week will not involve the emotional battles characteristic of all previous reductions of the work week, but rather that management and labor will approach the question from a factual basis and decide it solely on whether it will result in decreased production and increased costs, or whether production can be kept up and costs maintained or lowered. Many people may be surprised to learn that in manufacturing as well as retail organizations such a work week can yield maximum production and satisfaction.

There are some who are ostensibly worried about the shorter work week for fear that the employee will not know what to do with his spare time. If the company and the community are really concerned with this problem and attack it intelligently, it provides no cause for worry. Other people insist that an honest day's work stretches from sunrise to sunset and they believe that everyone should work an "honest day." In certain respects, this book is dedicated to the joys of working, but it also acknowledges that too much of anything can give cause for worry. The marvels of our productive ability have contributed toward the shorter workday and thus enabled us to transfer our interest to other things. An "honest day's" work is desirable, but there is no reason to believe that an 8-hour day—which was once 12 hours, then 10—represents the acme of honesty. If a college professor had to teach 8 hours a day, he would have no time to write books (maybe that would be a good thing!).

UNPRODUCTIVE WORKING TIME

In a survey and analysis of the working day (*1*) Angles found that over 30 per cent of the working day was unproductive. Collecting materials, delivering finished goods, sharpening and preparing tools, and consultations absorbed this 30 per cent.

The present author's observations of professional workers indicate that unproductive working time is much greater, amounting possibly to 50 per cent of the working day. Professional workers—be they researchers, writers, or statisticians—present weird problems to a director of research. The badge of distinction of this group seems to be the privilege of arriving between 10 and 20 minutes late. Coffee and newspaper time is a necessary allowance several times each day. Informal consultations with fellow workers take their toll. Taking a leaf out of the executive's book, the professional worker finds that the one-hour lunch period is totally inadequate; he usually manages to get around this by going to lunch at a different time every day, hoping thus to prevent a check being made on his habits. In some cases, it almost is three o'clock before the day's work is begun. Many professional people avoid a sense of guilt by bringing a brief case in which they take work home, but the work is rarely done until the deadline for the finished job is upon them.

This is not a tirade against professional workers; it is merely an illustration of the inroads that unproductive working time can make. The factory worker, the clerk, and the professional worker must acknowledge that a considerable part of the day is spent in unproductive activity. It is because of this that the nominal work week can justifiably be reduced without in any way affecting production.

Many attempts have been made to increase production by cutting down the unproductive time, but this will not be discussed here because it is not directly related to work fatigue or monotony.

REST PAUSES

In Chapter 2 it was shown that rest pauses are valuable aids to increasing production. However, the length of the rest pause and what the employee shall do during it deserve consideration.

From the point of view of management, it is best to give the employee a regular rest pause, for if management does not do so, the employee will take it anyhow. Some employees spend more effort and energy in "soldiering" on the job than in doing the work they are supposed to do. A typist may not leave her desk or take her fingers away from her machine, but she may be indulging in a rest pause; she may be typing personal letters or other material not connected with her job. The professional worker who is suddenly attacked by drowsiness during the afternoon learns to rest his head on his hand with his index finger propping one eye open as if he were in the process of "creating." The man who works at a machine often finds it necessary to adjust the machine—it suddenly "doesn't seem to be working just right." In other words, during a normal working day, employees will take a rest pause. When management offers such a rest or forces them to take one, much is gained in the form of good will and a reduction of guilt feelings, plus the alleviation of fatigue or monotony if it exists.

Depending upon the type of work, the number and duration of rest periods vary. For most jobs a 10- to 15-minute rest in mid-morning and mid-afternoon seems to bring the best results. To determine definitely whether one or two rest periods are necessary, data should be gathered on production and the employees should be interviewed. Such brief experimentation will often lead to the correct answer.

It is important that the employee change his posture during the rest pause. If he sits while working, he should be encouraged to stand or walk around. If he stands, he should be encouraged to sit down or, if possible, to lie down. The important thing in a rest pause is that the activity and posture of the body be different from the activity and posture required on the job. For example, basketball as it is played today is strenuous and active. Watching the leading college teams play provides a vivid illustration of the principle that the activity should change during the rest pause. However, various teams do different things during the rest period. Some just sit; others stand, and still others lie down. Some teams seem to be so disorganized that the men can do anything they want to during the period. But regardless of posture or activity, all the teams seem to recover equally.

In some industrial organizations refreshments are served during the rest pause. The value of the coffee, soda, or ice cream that is provided lies in creating a favorable employee attitude toward the rest and in filling the time, rather than in supplying nourishment for the energy needed to continue work.

ABSENTEEISM

THE incidence of absenteeism should not be overlooked in considering the relationship between production and nominal hours of work per week. An increase in the work week often results in an increase in absenteeism, which ultimately means a reduction in the hours worked. Any serious investigation of the causes of absenteeism reveals that there are numerous reasons for it. Also, an employee often has more than one reason for being absent. Schenet (*19*) conducted a careful survey of absenteeism in a certain factory. The study, which was based upon an analysis of the records of 280 men and 470 women over a four-month period, showed that absenteeism was three times greater among women than among men. For sickness absences the rate for women was twice that for the men, and for personal absences the rate was three or four times greater for women than for men. There was no great difference in absentee rates on the basis of age groups, except for a very slight tendency for older employees to be absent more frequently. Schenet found vast differences in absenteeism from one department to another; in the final assembly department the absentee rate for both sickness and total absences was the highest of all. He regards this as extremely puzzling and says that no data were uncovered that shed any light upon it.

In a study based upon a sample of 550 employees, Jackson (*11*) found that the causes of excessive absenteeism were as follows:

1. Poor work habits	6 per cent
2. Personal adjustments	9 per cent
3. Dissatisfaction with work	16 per cent
4. Irresponsibility	17 per cent
5. Outside difficulties	17 per cent
6. Sickness or fatigue	35 per cent

His work, together with other material in the literature, indicates that although sickness is the greatest single cause of absenteeism, it is only a minor cause when the total picture is considered.

Individual adjustment, emotional difficulties not related to the job, and other individual problems contribute to make absenteeism a psychological problem. It is advisable to ask an employee with a high absentee rate to come in for an interview in which the basic reasons for his absenteeism can be discussed. Often, during such an interview, the groundwork can be laid for a better understanding with him and attempts can be made to correct the irrelavant conditions which may be responsible for the absenteeism.

It is interesting to note that absenteeism is highest at the beginning and end of the week and lowest on payday regardless of what day in the week it falls on. The distance traveled to and from work and household responsibilities, especially on the part of women employees, are also factors which contribute to excessive absenteeism.

The point to be remembered about absenteeism is that employees must have time to take care of their personal needs; if the hours of work prevent this, then absentee rates will be high. When an employee takes time off on his own, he often feels that since he is paying for it he does not have to inform management in advance. If management were to grant an employee a half-day off for shopping, it might result in an increase in production, rather than a decrease, if for no other reason than that management would have someone else take his place on the production line.

The foregoing makes it clear that the incidence of absenteeism, solely because of excessive fatigue, is low.

SUMMARY

THE elimination or reduction of fatigue is desired by employers and employees. Fatigue has been studied in the laboratory and in industry but still has not been adequately defined. Neither tests that measure changes in physiological conditions due to work nor performance tests have as yet been established as valid measures of fatigue.

Such related phenomena as mental fatigue, monotony, and boredom are often confused with fatigue. It is likely that mental fatigue does not exist as an entity apart from physical fatigue and that the tension accompanying some tasks produces fatigue to a greater extent than the task itself. Monotony is not inherent in a job; rather it is a result of the worker's attitudes and abilities in relation to the job.

Fatigue can be reduced in industry by the introduction of rest pauses. Their duration and number should be determined on the basis of the type of work performed. Monotony can be reduced by selecting employees more carefully, by making work more meaningful, and by providing recreational activities.

The crux of the problem in industry is the relation between hours of work and total production. Shortening the work week does not necessarily result in a decrease in production. Much evidence indicates that production is maintained, or even increased, when the work week is decreased. This is true because the nominal hours of work are not the same as the actual hours worked; reduction in working time may decrease the nominal hours but not the actual hours.

The work week has been steadily decreased and there is no reason to believe that the 40-hour week is the ultimate optimal week.

Absenteeism in industry occurs for many reasons. Sickness is the greatest single cause but not the major reason. Personal needs and other individual problems contribute heavily to absenteeism. Allowing the employee time off often reduces absenteeism and increases the number of hours actually worked.

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11. Work Environment

THE problem of increasing production and also making work more pleasant has been approached through the introduction of changes in the working environment. There is a fundamental difference between this approach and that in which increased efficiency is attained as a result of time and motion studies. Although such studies sometimes lead to environmental changes, the changes are usually related to the job, such as changing the height of a stool or the size of a work area. In other words, time and motion studies most often result not in environmental changes but rather changes in an integral part of the job.

There are still other approaches, such as increasing efficiency through refined selection techniques. Under these circumstances no direct attention is given to the environmental factors related to the job.

The list of the various environmental changes that could conceivably be introduced in industry is lengthy. Changes related to noise as it affects work, as well as changes in connection with the illumination, ventilation, and temperature of the work environment, have been introduced with varying claims of success. A popular environmental change at the present time is the introduction of music into the office or factory. Many claims in connection with a change in production have been based on the use of various color schemes, primarily on factory walls, but also on benches and machines, and in rest rooms.

Another category of environmental changes for improving production includes such miscellaneous items as eating facilities, fresh drinking water, and even the physical distance between two co-workers.

Unfavorable environmental conditions supposedly contribute to a slowdown of the employee's activities and production. They allegedly increase turnover, promote high absenteeism, and generally contribute to inefficiency.

There is no doubt that people generally prefer pleasant to unpleasant surroundings and that when attention is paid to creating a favorable working environment, as well as to actual job performance methods, over-all efficiency is increased. However, one must be somewhat cautious in accepting all the claims made as to the results of creating a favorable work environment. Much of the work that has been done in this field has been guilty of serious error in its experimental methodology, and naïve assumptions have too often been made with reference to the work. In an ideal experiment one factor is varied and all other factors are either eliminated, neutralized, or held constant.

It is not safe to assume that a change in production can be attributed to a specific environmental change. When an environmental change is made, at least two things happen. First, there is the changed environment, and second, and equally important, there is the response to change in general. This response may be due only partially to the specific change; it may also be due to change of a more generalized nature. Suppose that sound control is introduced into a plant and that work proceeds with less noise. Let us assume that production increases 5 per cent. According to sound scientific procedure, we are not justified in attributing this 5 per cent increase solely to sound control. Although a certain amount of the increase *is* the result of the sound control, a certain amount of the increase is due to the fact that *a* change has taken place. The attitude of the employee must be reckoned with in this connection, for the same 5 per cent increase in production might have occurred when *more* noise was introduced. For instance, in a hypothetical situation production might conceivably be low because the employees spend their time talking to one another. If someone introduced a new infernal machine which created so much noise that it made conversation impossible, we would be more cautious in coming to the conclusion that the introduction of the noisy machine, of itself, increased production.

In other words, the major problem in the introduction of environmental change is whether the resulting increase in production is to be attributed to the factor that is changed or to the factor that is incidental to *a* change.

In addition to this error in methodology, there is the fact that the employee and his attitude toward change have not been fully taken into consideration. An altruistic employer may take steps to improve the work environment, but whether such steps will result in increased production —as is always claimed—will depend upon how the employees as a group interpret this change. If they believe that he has spent a lot of money in order to take advantage of them, they will resist the change, even though the environment is made more pleasant. If, on the other hand, the change raises morale, it will have the result he desired.

An excellent illustration of this is the case of the employer who had his factory and sales room in the same building. Air conditioning was installed in the sales room, but not in the factory. The employer succeeded, primarily, in creating greater dissatisfaction. The salesmen disliked the air conditioning because they believed that they would have more colds because of it. The factory employees, who recognized that they held jobs of less prestige value, interpreted the change as just another instance of their being held in lesser esteem. Both groups felt that the installation of air conditioning in the sales room was motivated not by their employer's concern for his employees' welfare but solely as a method of increasing business.

The Hawthorne Studies, reported rather fully in Chapter 2, reviewed the effects of a change in illumination on production. It will be remembered that no direct relationship was shown to exist between the physical change and production. The contribution of the Hawthorne Studies in relation to all changes involving environmental conditions is significant.

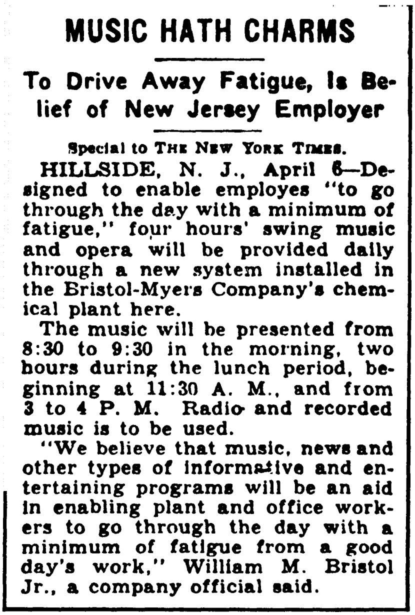
Too often variables are not controlled. For example, an increase in temperature and the resulting production figures will be reported without taking the precaution of determining whether no temperature change or a decrease in temperature would result in a change in production.

The essential point in connection with studying changes in work environment is the use of adequate experimental controls before conclusions are drawn. The author considers that changes in work environment, especially when they are conducive to more pleasant surroundings, are desirable. However, a change in production figures often has little or nothing to do with such environmental changes. This does not mean that one should forsake the idea of introducing music, decreasing noise, or controlling the temperature of the work room. It *does* mean that miracles cannot be expected as a result of these changes, and that each positive claim must be substantiated.

MUSIC IN INDUSTRY

THE most popular environmental change at the present time is the introduction of music during working hours. Although plant-broadcasting is little more than twenty years old, most of the "sound and fury" has been recent. Possibly one of the reasons for the popularity of music is the variety of ways in which it can be provided. On an extremely informal basis, music can be brought into a plant by merely plugging in a radio and allowing it to blare from the beginning to the end of the workday. Some employers have introduced music in an even more informal way by encouraging their employees to sing. Every now and then a newspaper clipping, like that in Fig. 26, causes an employer to think about the idea.

In this connection, a sad yet humorous experience was called to the writer's attention by an employer who had a small factory. This man had serious doubts about the advisability of music in industry; he said that there had been bedlam in his plant ever since he allowed his employees to sing. His story was so pathetic and so amusing that the writer visited the factory. The girls worked at a series of long work tables in relative silence; suddenly one girl would start to hum, and the others would join her shortly afterward. Actually, this man's employees comprised two minority groups; singing seemed to make the girls suddenly conscious and proud of their minority status. When



MUSIC HATH CHARMS

To Drive Away Fatigue, Is Belief of New Jersey Employer

Special to THE NEW YORK TIMES.

HILLSIDE, N. J., April 6—Designed to enable employes "to go through the day with a minimum of fatigue," four hours' swing music and opera will be provided daily through a new system installed in the Bristol-Myers Company's chemical plant here.

The music will be presented from 8:30 to 9:30 in the morning, two hours during the lunch period, beginning at 11:30 A. M., and from 3 to 4 P. M. Radio and recorded music is to be used.

"We believe that music, news and other types of informative and entertaining programs will be an aid in enabling plant and office workers to go through the day with a minimum of fatigue from a good day's work," William M. Bristol Jr., a company official said.

FIG. 26. Music Hath Charms. (By permission of *The New York Times*.)

one girl began singing a native song and was joined by others in her group, this was a signal for the other group to sing some of its native songs. From then on, challenge was hurled upon challenge, volume increased steadily, and chaos ensued. Needless to say, this is not the way to use music in industry.

Music broadcast by radio requires a minimum capital investment—the purchase of a radio—but may introduce other difficulties. Just what station is to be tuned in and who shall have the right of decision often becomes a problem of management. Years ago a factory that manufactured radio tubes had to prohibit playing the radio during lunch hour because of the excessive arguing among the employees as to what type of program they should listen to. The installation of additional radios was no solution. This company temporarily solved the problem of music during the lunch hour by permitting phonograph records to be played. Since the employees brought in the records and they were played in sequence, there was less chance for bickering.

Another disadvantage of the radio for industrial use is the commercials. Further, the type of music cannot be controlled. It is a fact that young women workers will, according to the fashion of the moment, not only stop work but even swoon when some crooner is broadcasting, and the crooner is on the air more often than the boss would like. The radio may not be heard with equal intensity and clarity in various parts of the plant, but a loud-speaker system can overcome this.

A more desirable method of providing music is to use either piped-in music or a standard system of industrial broadcasting controlled by the firm itself or by an outside source.

The generalization is possible that music during repetitive factory work results in a slight increase in production. Some of the best experimental work in this field has been directed by Willard A. Kerr (*6*). Recognizing the

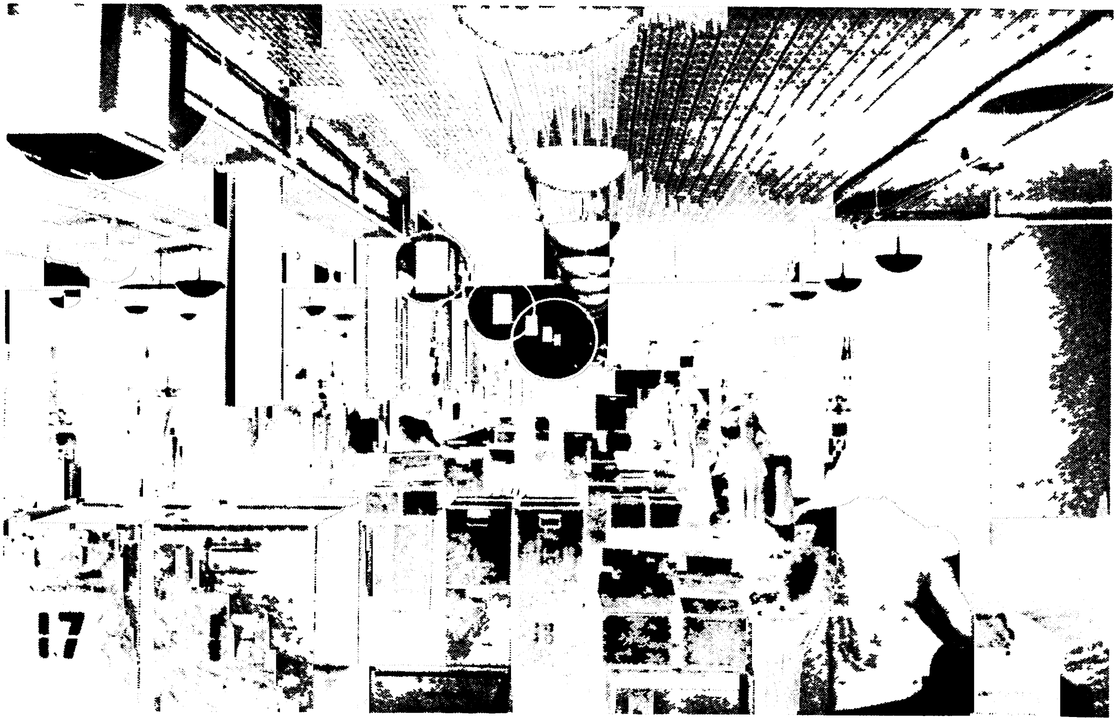


FIG 27 Location of Loud Speakers for Effective Music Broadcasting. (By permission of Muzak Corporation.)

need for basic research in order to clear up the maze of anecdotes and armchair speculations on the subject, he carried out four specific experiments on the introduction of music in actual industrial conditions. In all four experiments, records were played over the company broadcasting system.

The first experiment was made in the Paper Capacitator Department of a modern factory and lasted a little less than two months. On "music days" a varied musical program was broadcast to all 197 employees at the following times: 9 to 9:15, 10:15 to 10:35, 11:30 to 12:00, 12:00 to 12:20, 1:30 to 1:45, 2:45 to 3:10, and also at the beginning and the end of the shift. The subjects in this experiment were 64 women operators, 90 per cent of whom had been accustomed, for at least five months, to music in the department. This latter control is important because the fact that the employees were accustomed to music made it possible to test the effect of music rather than the effect of a change. The subjects were not told that they were taking part in an experiment; this is also important, because production might vary as a result of the suggestion of the experiment rather than of the experiment itself.

The experiment involved no change in working habits or conditions except that there was no music two days out of every four. On "no-music days" the employees were told that work was being done on the plant's sound system. Saturday was excluded from the experiment because the company recognized that the level of operation that day was irregular and subject to irrelevant outside influences. Although these influences are irrelevant from the company's point of view, it is ridiculous to presume that they are irrelevant from the employees' point of view. A heavy date Saturday night or the idea of a day off on Sunday can interfere with an experiment on music in industry. Furthermore, if these so-called irrelevant influences are not taken into consideration, they will interfere with an entire efficiency system, regardless of whether it is based on industrial psychology or something else.

Kerr collected data for each of forty days on three operations—roll assembly, winding, and can assembly. Quantity, quality, and net good yield—i.e., production with both quantity and quality taken into consideration—were the measures of performance obtained. Although none of the differences were statistically significant, *quantity* of production was higher in all three operations when there was music, but *quality* was worse in two out of the two operations where such a measure was available.

In the roll assembly operation quantity was +0.75 per cent better and the net good yield was +0.57 per cent better; but scrappage, which is a measure of the quality of production, was 9.89 per cent greater with music. The fact that production increased but so did spoilage raises a serious question as to what is the ultimate measure of success. In this instance, the answer is provided by applying the criterion of "net good yield," which is a combination of quality and quantity; in these terms, over-all production was bettered by approximately 0.5 of 1 per cent with music. For the winding operation, quantity was 1 per cent better, but scrappage was 14 per cent greater. Kerr found it impossible to obtain a net good yield value for this operation. In the can assembly operation quantity increased by +0.43 per cent. This first experiment of Kerr's indicates that there is a slight increase in production, but there is also an increase in spoilage.

The second experiment conducted by Kerr took place in a factory whose employees worked on quartz crystals. There were 53 subjects, all members of a union and working on a straight hourly rate; the experiment lasted 107 workdays. Again, music was played at the same periods of the day as in the first experiment. There were three days of music, then three days without music. Three kinds of music were broadcast, but on no two days in any three-day cycle was the same type used. The first kind consisted of a variety program and included such selections as "Smoke Gets in Your Eyes," "Good Night Aloha" and "Emperor Waltz." The second was "sweet" music—not jazz and not too heavily accented; examples are "White Blossoms of Tah-ni," "Missouri Waltz," and "This Is No Laughing Matter." The third type was "peppy," typical titles being "Hot Clarinet Polka," "Jersey Bounce," "Ti-Pi-Tin," and "The Stars and Stripes Forever." Because of the length of time covered by the experiment, it was assumed that the effects of outside influences, such as weather, payday, personal joys and sorrows, or a bad run of quartz, would be eliminated or held constant.

Six measures of production were obtained for "no music" and the various types of music. Fig. 28 presents the results, with net good yield as the criterion. Once again Kerr finds none of the differences obtained approaching statistical significance. The quantity of crystals finished is greatest with peppy music, but the quality is poorer than with variety or sweet music.

There are no consistent differences on the basis of type of music, but a production increase is found when the average for 56 music days is compared with that for 51 no-music days. Scrappage is lower on music days than on no-music days. Whereas in the first experiment the average increase in production was about 0.5 of 1 per cent, in this experiment the average increase is much greater. For example, the 40 employees doing the finishing job showed an increase in quantity of 4.82 per cent with music and 8.3 per cent less scrappage; the net good yield is 9.07 per cent higher. The net good yield among the 53 employees is +7.64%. Kerr finds that all differences in the six measures of production favor music as opposed to no music.

In his third experiment, Kerr used a group of 520 women operators in a glass radio tube factory. This factory had broadcast to its employees a radio music program

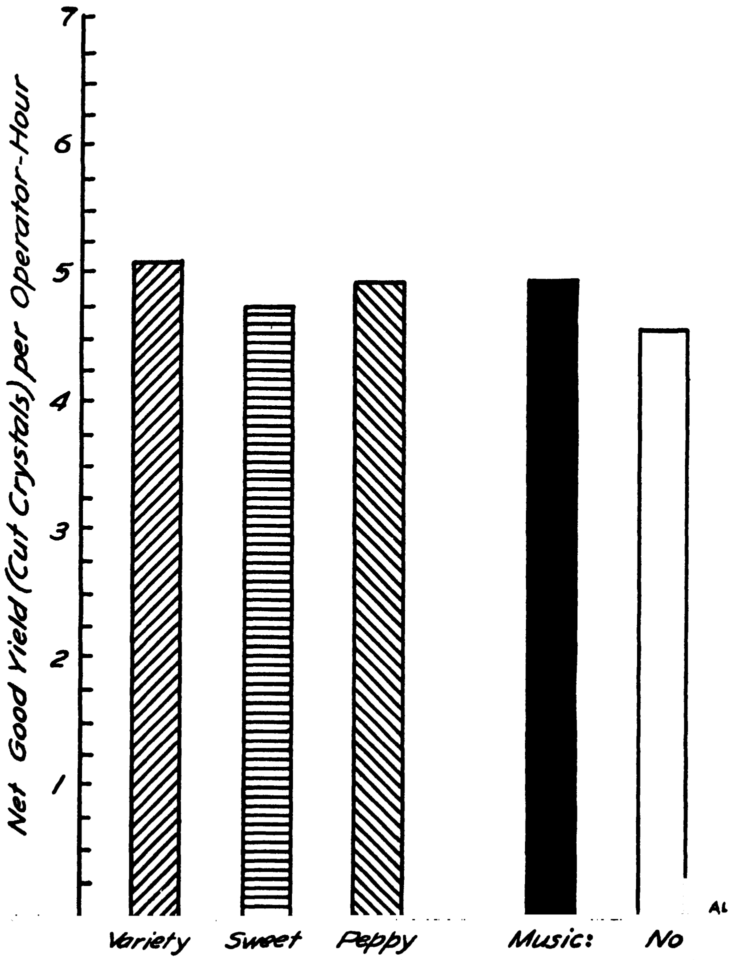


FIG. 28. Effect of Various Types of Music on Production. (Reprinted from *Experiments on the Effects of Music on Factory Production* [Applied Psychology Monographs, No. 5], by Willard A. Kerr, with the permission of the author and of the publishers, Stanford University Press.)

known as the "Make-Believe Ballroom" over a long period of time. In addition, a birthday, anniversary, and soldier request program was broadcast between 1:00 and 1:30 P.M. According to management, this program was very popular and it was deemed unwise to discontinue it during the experiment; accordingly it was continued.

A music-preference questionnaire survey was conducted among the employees, sixteen types of music being ranked from most to least popular, as follows:

1. Hit Parade type
2. Patriotic
3. Waltzes
4. Marches
5. Hawaiian
6. Semi-classical
7. Polkas
8. Sacred
9. Hillbilly
10. Classical
11. Blues
12. Western
13. Fast dance
14. Spirituals
15. Humorous-novelty
16. Square dances

All sixteen types were liked to some extent; the average of each of these categories was always greater than the indifference point. On the "more-music" days one of three types of music—Hit Parade, Waltz-Hawaiian, and march-polka—was played at the following times: 8 to 10:30 A.M., 11:00 to 11:45 A.M. and 1:30 to 3:15 P.M. In terms of the above questionnaire rankings, the first type was the most popular; the second type included the third and fifth most popular, and the third group included the fourth and seventh most popular.

Before the experiment was begun, the group was told that it would hear a specific type of music on a given day. On one day it would be Hit Parade music, on another, only waltzes and Hawaiian music; on the third, polkas and marches. It was also told that on some days there would be no music, except the two programs which it had been accustomed to hearing. The group was informed that after some weeks it would be asked to vote on the type of program it most preferred.

Three jobs, all requiring a high degree of hand-eye coordination, were performed by these 520 operators. One interesting finding was that the amount of music played on march-polka days had to be reduced because of the complaints from the employees. Some of these workers threatened to quit unless "something is done about those marches and polkas." However, when this music was included in the Hit Parade programs, there were no such complaints.

Again, as in the preceding experiments, Kerr obtained production averages for the various types of music days. We should mention that these employees were on an incentive basis. The findings are presented in Table 26.

TABLE 26. Average Quantity and Quality in Radio-Tube Manufacture with More Music, Less Music, and Various Kinds of Music

Output	Hit Parade (14 days)	Waltz-Hawaiian (14 days)	March-Polka (13 days)	Less Music (13 days)	More Music (41 days)	Per cent Better with More Music
Quantity						
Miniature tubes	13.65	12.89	15.34	13.70	13.92	+1.61
Glass and power tubes	13.12	13.09	12.92	12.92	13.05	+1.01
Quality						
Miniature tubes	95.94	94.30	95.54	99.40	95.41	−4.18
Glass tubes	79.35	76.29	76.65	85.64	77.48	−10.53
Power tubes	97.77	100.35	104.83	101.97	100.90	−1.06

Both output and quality were lower on waltz-Hawaiian days than on Hit Parade or march-polka days, even though complaints and comments indicated that the employees liked waltz-Hawaiian better than march-polka music. The few complaints against the waltz-Hawaiian programs were: "They put us to sleep." Production on march-polka days was slightly greater than on Hit Parade days, but the quality was better on Hit Parade than on march-polka days in two of the three cases.

Kerr's fourth experiment was concerned with the differences between orthacoustic recordings and ordinary records. Slight but statistically non-significant differences appeared in favor of orthacoustic records. However, since the playing time for the ordinary record was three minutes and for the orthacoustic two and a half minutes, it may be that this, rather than any difference in the quality of recording, was responsible for the results.

The primary reason for reporting this series of experiments in such detail is to illustrate careful industrial experimentation. Although the findings in general show that production increased slightly, they make it clear that the introduction of music does not increase production to any considerable extent. The big problem in relation to music in industry—the attitude of employees toward the music—is touched upon only slightly by Kerr. His third experiment showed that there is no definite relationship between the order of preference as to type of music and production. In fact, music of an unpopular variety, the polka-march category, does not affect production at all.

In another study in this field, Smith (*9*) distributed a questionnaire to approximately 1000 employees in a factory manufacturing a small radio part. The results showed that 98 per cent of the employees thought that music during working hours would be "mildly pleasant" or "extremely pleasant." In studying a day shift and a night shift of 21 employees each, Smith found that the average production increase for the day shift was 7 per cent, and for the night shift it was 17 per cent. However, this increased production may be due only in part to the music; some of it may be due to the change.

Smith found that maximum production was obtained when music was played 12 per cent of the time on the day shift and 50 per cent of the time on the night shift. The more an employee wanted music, the more the music tended to increase his production; and the more the employee's job permitted conversation while working, the more the music tended to increase his output. Smith concludes, "Music probably produces its major direct effect when the individual's capacity for attention is not absorbed by his work; in this circumstance, music appears to direct unused attention from brooding, talking, or off-the-job activities."

A factor that is generally ignored in studies of the effect of music on production is rhythm. It is entirely possible that music influences production most when its rhythm is compatible with the employee's rhythm of work or when it tends to pace him.

An unpublished study by a student in a class in industrial psychology clearly established that more people skate on a rink when waltzes are played than with other types of music or when there is no music. Furthermore, the speed of the skaters increases during waltz music.

Music in industry has recently been extended to offices as well as factories. An organization known as Muzak has done some research in both fields. According to the research director of this company, waltzes, ballet music, light concert selections, and concert arrangements of popular dance music are suitable for office workers.

> Among the concerns regularly using planned musical programs for their office employees and being programmed by Muzak are Metropolitan Life Insurance Company; Northern Mutual Insurance Company; Research Institute of America; Reader's Digest; Erwin, Wasey & Company, Inc. (advertising agency); Bank for Savings (all branches); American Cyanamid Company; American Tobacco Company (general and executive offices); Chemical Construction Company (architectural and drafting rooms); Prudential Insurance Company of America; Emigrant Industrial Savings Bank; Reuben H. Donnelley Corporation; Liberty National Bank; McGraw-Hill

Publishing Company, Inc. (direct-mail offices); McClellan Stores Company (general and executive offices); National City Bank of New York (personal loan division); Detroit Edison Company; Washington Gas Light Company (accounting offices); Sears, Roebuck & Company of Philadelphia (mail-order department); and Thomas Publishing Company.

Production records suitable for office workers are more difficult to obtain than those for factory workers; consequently the results indicating the desirability of music are based on employee responses to a questionnaire. All the surveys conducted by Muzak show that employees are in favor of planned music during work.

There is need for an experiment among office workers of the type that Kerr conducted among factory workers. Apparently employee effort and attentiveness can counteract or vary the influence of periods of music. Although there is not much evidence to support this assumption, it is partly supported by the conclusions in a somewhat related field, noise in work.

NOISE IN WORK

Noise is generally regarded as a distracter and therefore as interfering with efficiency. In an experiment to determine the effects of noise (*10*), Vernon and Warner had a group of subjects do arithmetic problems and also read material in a book on psychology during alternating periods of noise and quiet. It was found that noise had no appreciable effect on the speed or accuracy of doing arithmetic problems, but that there was a slight increase in the expenditure of energy as measured by oxygen consumption. The factor primarily determining whether noise is a distracter is its character—whether it is steady or intermittent. When the noise is steady, the person adapts himself to it; but when it is intermittent, he must make a greater effort to maintain efficiency.

The effect of noise on a job is apparently determined by whether the noise is a necessary accompaniment to the job or not. For example, a typist becomes used to the clatter of the machine because it is a necessary accompaniment to her work, whereas a person working next to her finds this noise an interference. Office workers in close proximity to machines in a factory are disturbed by the noisy machinery to a greater extent than the workers operating the machines.

Some years ago, Morgan conducted an experiment (7) to discover how a person reacts to irrelevant noises. This experiment indicated that at first such noise generally retarded the speed of work, but that this was often followed by an increase in speed. The resulting speed was frequently greater than that achieved prior to the introduction of the irrelevant noises, because the subjects made an extra effort to overcome the effect of these noises. In Morgan's experiment, the subjects exerted greater pressure on the keys and evidenced an increase in articulatory reactions. Morgan found that although noise does not necessarily interfere with efficiency as measured by production, it results in inefficiency as measured by energy cost. Ford reports similar findings (5). The only additional evidence indicates that quiet as well as noise can constitute a distraction; thus the quiet that follows the cessation of noise acts as a distracting influence. This was confirmed both by the objective data and by the introspective reports of the subjects. In other words, an employee who has adjusted himself to a noisy work situation may be distracted by a sudden silence.

This does not mean that bigger and better noises should be sought. The evidence indicates that although production is not curtailed by noise, more energy is expended in the form of increased effort. Although quiet working conditions are desirable, it does not follow that silence is necessarily golden. However, long-term studies on the effect of continued loud and intermittent noise have yet to be made.

ILLUMINATION IN INDUSTRY

FERREE AND RAND of the Research Laboratory of Physiological Optics have conducted much research on illumination and its relation to work. Their findings (*3, 4*) summarize much of the worth-while information in this field and make possible the following generalizations.

Daylight provides the best illumination for work. Artificial lighting which closely approximates daylight in color and composition is next best.

Important characteristics of lighting which should be taken into consideration are the distribution and location of lights, the intensity of the light, glare, and the combination of artificial light and daylight. The best artificial light is the Mazda or yellow light; this has been found to be superior to the blue glass light, for maximum visibility is obtained in daylight or in lighting that approximates daylight as closely as possible. Artificial light should be as free from color as possible; light that is unbalanced toward any color is a detriment and not a help. Of the colored lights when equalized for brightness and saturation, yellow causes the least discomfort.

Possibly the most important difference between daylight and artificial light is diffuseness. Sufficiently diffuse light tends to produce less glare. Ferree and Rand are somewhat disturbed at the tendency to sacrifice diffuseness of light for high intensities. Excessive intensity and poor diffusion can result in considerable damage to the eye.

One of the most common causes of visual discomfort and fatigue is brightness in the field of vision. Excessive brightness is often due to the source of light or the light fixture. Attempts to solve this problem have been made by devising lamp shades or in some other way shielding the eyes from the glare. A reflector that is turned down gives what is known as direct lighting; the light is directed toward the work area, the walls and ceilings being left dark or very poorly illuminated. In indirect lighting, the light is directed to the ceiling; from there it is reflected to the other parts of the room, especially the work area. This usually results in a disproportionately high brightness for the ceiling and a correspondingly low intensity in the work area. Translucent bowls which reflect part of the light to the ceiling and transmit part of the light downward have overcome the disadvantages of both direct and indirect lighting.

The problem of unevenness of lighting is clearly brought out in the ordinary lamp. Although the desk lamp may make the work area sufficiently bright and at the same time save electricity costs, it results in a very unevenly lighted room. Most people, while working at a desk, continually look up or away from the work area; this requires continual pupillary adjustment, with resulting fatiguing effects. A makeshift arrangement would provide a lamp in another part of the room, thus reducing the difference in the light at the desk area and in the balance of the room, thus reducing eyestrain.

Ferree and Rand conducted tests on 550 people; 100 were in each ten-year age range from 10 to 60 years, and 50 subjects were over 60 years of age. Approximately 70 per cent of these people preferred less than 15 foot-candles for reading 10-point type; 50 per cent preferred less than 11.3 foot-candles. Individual differences are evident in this type of experiment as in every other in psychology. These authors found a wide variation in the preference expressed in each age group. The people above 35 years of age tend generally to prefer more light for reading than those below 35.

A very important factor in lighting is glare. Glare may emanate from the work area or from the light source. All glare from the light source can be eliminated by the Glare-Baffles devised by Ferree and Rand.

These authors have also conducted useful research to dispel the peculiar notion that the mixture of daylight and artificial light is detrimental (*1, 2*). Even at present it is generally believed that such a mixture is unfavorable to vision; hence when artificial lighting is needed, some people take elaborate precautions to curtail daylight. Actually, there is no reason for this, because a mixture of the two gives a better and more comfortable light than an equal amount of artificial light alone.

A possible source of this popular misconception may be the difficulty experienced at twilight, when it is neither dark nor light. Anyone who has driven an automobile is especially aware of this. This difficulty is not due to the combination of artificial and natural light; it results from the process of visual adaptation. The eye has been accustomed to bright light and the change in light requires a change in adaptation. As the darkness increases and adaptation to it becomes more perfect, one sees more clearly.

In their experiments on the effects of the color of paper and ink on visibility Ferree and Rand find that black ink on white paper that is free from gloss, is best. White is the best color; saturated colors—saturation is the amount of color in the color—are inferior to unsaturated colors. Darker shades are inferior to lighter shades. When colors are equalized in saturation and brightness, yellow is found to give the best results and an orange-yellow is next; but all colors are inferior to white.

Illumination and color are also considered in the combinations used for automobile license plates. From what has been said, black on white should be best, but road conditions tend to make the white look black—and black on black is not outstanding. Actually, the experiments that have been conducted in this field show that black on yellow is conducive to greatest visibility (here New York, California, and the other states that use this combination score). The greens, blues, and other colors used on other license plates probably are a matter of local pride, rather than an aid to visibility.

COLOR IN INDUSTRY

As FAR as preposterous claims and unsubstantiated allegations are concerned, the so-called "color specialists" are eligible for the "grand prize." An article which appeared in *Popular Science Monthly* in 1947 dealt vividly with the use of color in industry. With reckless abandon it claimed that less fatigue, increased production, and greater safety result from the "scientific use of color in the factory." Some of the stories cited in this article are amazing. For example, as a result of "color conditioning" (whatever that is), one factory is reported to have had an increase of 15 per cent in production and 40 per cent in accuracy, along with a 60 per cent decrease in absenteeism; in addition, "workers take more pride in caring for plant and equipment." This latter may provide a clue to what really happened. If the factory was originally dirty and unpainted and then the painters went to work—providing they were prevented from painting in stripes in hideous hues—it may well be that the employees liked the new conditions of work. But any of a number of color combinations might have had a similar effect. The essential point is how badly the factory needed the paint job in the first place. Any home owner knows the marvels wrought by a coat of paint inside or outside the house.

This is not to imply that all work involving the color of walls is nonsense. The ability of the surface to reflect light and the contrast between the color of the work area and the wall color may in certain circumstances reduce eyestrain. For example, according to the above article, girls who inspected blue denim in a textile mill reported that they saw a peach color when they looked at the wall. It is a fact that positive and negative after-images occur when the eye is overstimulated by one color. If a person looks steadily at a red square for approximately one minute and then looks immediately at a neutral background, he will see a green square on that background. This is a negative after-image. To return to the textile inspectors who saw "peach," there is no reason to believe that peach was the after-image, because the negative after-image of blue is yellow. However, if the blue had green in it, the after-image may have been a poorly saturated red which might be called peach. The article goes on to say that a "color engineer greatly increased the time the girls could work without strain at this job by providing what their eyes demanded: peach-colored walls."

There is some basis for the idea that blue is a cool color and red a warm color, and interior decorators as well as "color experts" recognize this. Depending upon the illusion to be created, feelings of warmth or cold may be encouraged by the use of these colors. But it is unlikely that the introduction of these colors will compensate for even a 5-degree change in temperature.

The evidence on the relation between color in industry and increased production is primarily based upon data that have not been subjected to rigid experimental tests. Consequently this field must be considered a greater unknown than music, noise, or illumination.

MISCELLANEOUS FACTORS

A CAFETERIA is often installed in a plant because of necessity. A factory at some distance from restaurants or other eating places will have to have a cafeteria in order to attract and hold employees. However, a cafeteria is likely to become a thorn in the side of management. An insurance company in New York City supplies hot lunches to its employees; the meals are wholesome and provide a thoroughly balanced diet. But to induce employees to eat in the cafeteria, this company has a rule forbidding them to get their coats until the end of the day. Consequently, even on the coldest days employees can be seen dashing from the building without coats to go to the nearby soda fountain for a sandwich, a cigarette, and an ice-cream soda. Complaints about food, especially when it is supplied by the company, are very common. Hence most industrial cafeterias are a source of employee dissatisfaction as well as overhead cost. Even so, they are sometimes necessary as an environmental change.

A new fad in industry is the "snack bar" or modified canteen. Factory employees apparently like a chance to insert a nickel in a juke box and drink a coke out of an automatic dispenser during a rest pause. Here again, however, it must be remembered that the employees' attitude toward environmental change will determine whether such a change will be accepted or rejected. A rest pause spent in a canteen is apparently more favored than straight relaxation. It promotes social activity.

The drinking fountain with its cool bubbling water sometimes provides the employees with an excusable rest period that, especially during warm weather, is relaxing and refreshing. Employees resent the fact that drinking fountains may not be located near enough to the work area, but a small capital investment often solves this problem.

The greatest bone of contention among many employees is the condition of the rest rooms. The amount of space devoted to the rest rooms, as well as the sanitary conditions, are important contributors to employee attitudes. When such facilities are inadequate or lacking, this may have a serious effect on job performance.

There are many other environmental aspects of a job that are related to the ultimate attitude of the employee and the morale of the group. Although few if any experiments have been made in this field, no claims as wild and weird have been made as those made in connection with color in industry.

In closing this chapter the reader is reminded of the Hawthorne Studies reported in Chapter 2. The experiments on illumination suggested the danger of overlooking employee attitudes and morale in attempting to relate changes in production to different environmental conditions. In addition, these studies showed the relationship between production and the interpersonal relations of employees. The foreman, the supervisor, the boss, the "expert" all play an important role as individuals and help to determine the employees' perception of the change in the environmental situation. These people may contribute to an increase in production as much as a new environmental factor does. Change in work environment should be considered not as a separate entity but rather in relation to interpersonal relationships of employee and employer.

SUMMARY

NUMEROUS environmental changes are possible slight aids to increased production and efficiency. Sometimes they are effective because they directly produce greater efficiency, and sometimes because they contribute to more favorable employee attitudes which ultimately results in increased efficiency. The most popular of these environmental changes at the present time involves music in industry. Slight but nevertheless consistent increases in production occur. Approximately 5 per cent is the maximum increase that can be reasonably expected; in most circumstances the increase will probably be less. But spoilage is also likely to increase; hence the decision as to whether to make music available will depend upon the ratio between the increase in production and the increase in spoilage. Music broadcast for definite short intervals is apparently better than music from a radio that is on all day.

Effective illumination increases visibility because of the

more even distribution of light and the elimination of glare. Daylight is the best light; artificial yellow light is better than other colors.

Although substantial claims are made for the importance of color in industry, there is at present no clear-cut experimental evidence to support these claims. Noise increases an employee's effort but does not necessarily decrease his production. Noise that is intermittent or not a necessary accompaniment to the job decreases efficiency more than does steady noise or noise directly related to the job.

Among the many miscellaneous environmental factors that can contribute to greater efficiency provided a favorable attitude toward them is maintained are the cafeteria, the rest room, and the drinking fountain.

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12. Accidents

ACCORDING to the United States Department of Labor (*15*), industrial accidents cost workers and management $3,500,000,000 in 1946. They not only are costly to our industrial economy but they result in anguish, pain, and often death to the unfortunate individuals involved. Sometimes accidents are attributed to physical causes in the environment and sometimes they are considered to be caused by any of a number of items related to the human factor. The tendency has been to minimize the role of

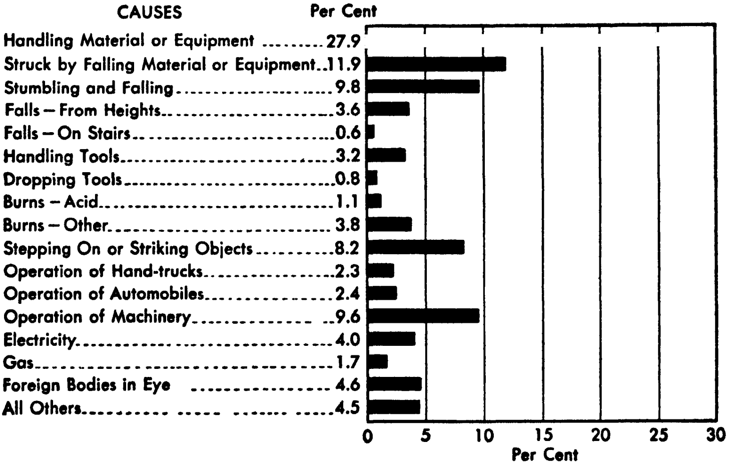

FIG. 29. Causes of Accidents. (Courtesy of the Metropolitan Life Insurance Company.)

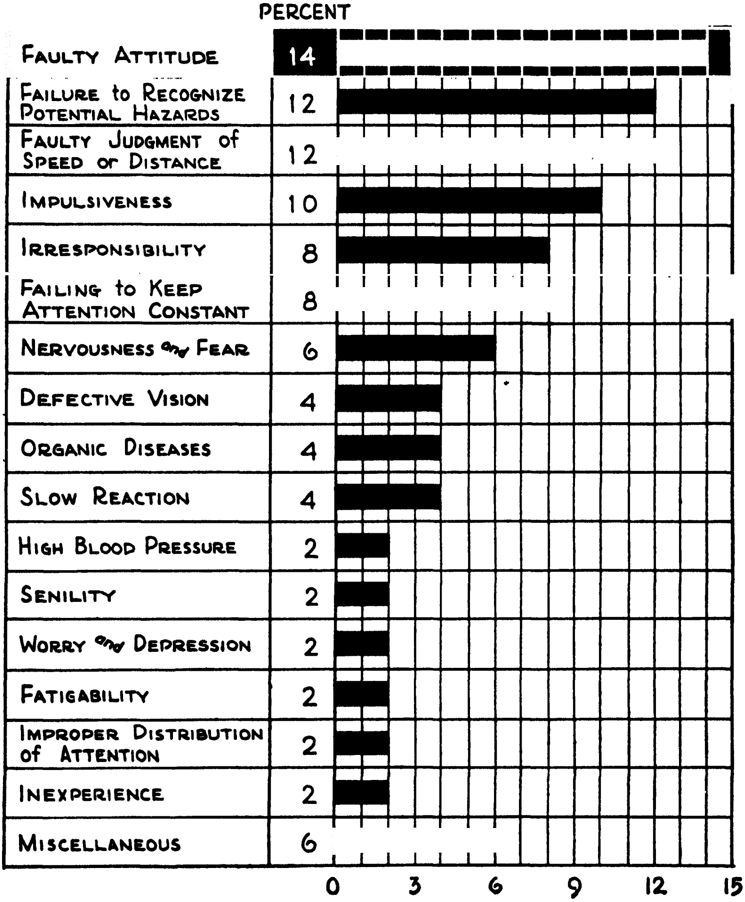

FIG. 30. Primary Causes of Accidents. (Courtesy of the Metropolitan Life Insurance Company.)

"luck" in accidents and to look for a specific cause. The chart in Fig. 29, which was prepared by the Metropolitan Life Insurance Company, lists the major causes of industrial accidents. However, this chart deals merely with the physical aspect of accidents and does not take into consideration the psychological factors at work in the individual at the time of the accident. The human factor as a contributing cause of accidents is emphasized in Fig. 30, which shows the primary causes of accidents among the employees of the Cleveland Railway Company; this study was done in cooperation with the Metropolitan Life Insurance Company.

This particular study (*1*), similar to many of those which preceded it, brings out the factor of accident proneness:

> Analysis of the accident records led to the discovery that a relatively small group of motormen were involved in a large percentage of all accidents reported, although operating under practically identical conditions as the other larger groups of trainmen whose accident records were, in most cases, excellent. This finding apparently confirmed statements of psychologists and psychiatrists that accidents do not distribute themselves by chance but that they happen frequently to some men and infrequently to others as a logical result of a combination of circumstances. Those individuals who because of certain mental, psychological or physical defects fail to control a situation leading to an accident when it arises, usually become involved, while those possessing the necessary physical and mental requirements show little susceptibility to accident.

These findings led to the belief that the incidence of accidents was an individual problem and that accidents could be reduced by studying the individuals who had them and removing the causes.

The treatment of people who were likely to have accidents was divided into three main categories: medical assistance, personality readjustment, and operating defects.

Medical Assistance. Physical difficulties were found to be of primary importance in 12 per cent of the cases. Defective vision, high blood pressure, and chronic appendicitis are examples of the type of disability which, when corrected, result in reduced accident rates.

Personality Readjustment. Faulty attitude, irresponsibility, and other personality problems were involved in 22 per cent of the cases. Although the railway company handled the "therapy" in a rather crude manner, successful changes in the individual employees were reported. The company had the superintendent talk to the employee and give him "a clear understanding of his personality difficulties and . . . point out to him frankly why they interfered with satisfactory performance on the platform and what the probable outcome of them would be unless a change in general outlook and behavior on the job were shown." Most of these men were placed on probation.

Operating Defects. The remaining 66 per cent of the cases were due to poor job performance, i.e., failure to recognize potential hazards, faulty judgment of speed and distance, and lack of attention. These shortcomings were overcome by retraining the men.

The results of this study were gratifying to the railway company. Thirty-three (or 75 per cent) of the men disappeared from the accident-prone group because their rate fell below the one accident per 1000 car-miles operated. The accident rate for the entire group dropped from 1.31 accidents per 1000 car-miles to 0.75, a decrease of 43 per cent.

ACCIDENT PRONENESS PRINCIPLE

WITH slight modification the statement, "Accidents do not distribute themselves by chance but . . . happen frequently to some men and infrequently to others as a logical result of a combination of circumstances," has become a generalization. This statement embodies the principle of accident proneness.

Mintz and Blum, who have critically evaluated the literature in the field, have come to the conclusion that accident proneness is overrated (*11*). A correct interpretation demands that the second half of the statement be worded as follows: Accidents happen frequently to some men, i.e., *some men have more accidents than would be expected by chance,* and infrequently to others, i.e., *more men have few or no accidents than would be expected by chance.*

To establish or support the principle of accident proneness, three methods can be used. In one method, the distribution of the total number of accidents in a population is compared with the distribution that would be expected if only chance factors operated. A comparison of these two distributions makes it possible to determine whether accidents happened more frequently to some men than would be expected by chance. The second method is to study the individuals and the number of accidents they have in two successive periods. A tendency for these people to have similar numbers of accidents can be regarded as evidence in favor of accident proneness. The third method is to compute the correlation coefficient of the accident records of a group for two periods.

In their study, Mintz and Blum found a considerable amount of careless reporting, illogical reasoning, and unfamiliarity with the statistical theory underlying accident proneness.

The most frequently offered evidence for the existence of accident proneness is the fact that a small percentage of the population has a large percentage of the total number of accidents. Such statements, by themselves, do not substantiate accident proneness; the obvious error in them is made clear by the following hypothetical situation: Two hundred employees have 100 accidents. If every employee has one accident there will be the opportunity for only 100 employees to have an accident record and yet this leads to the conclusion that 50 per cent of the employees have 100 per cent of the accidents. This situation is extremely unreal, for there is no reason to believe that each employee should have one accident. According to chance,[1] approximately 121 in a population of 200 should have no accidents, 61 people should have 1 accident, 15 people should have 2, and 3 people should have 3 accidents. On this basis, the expectancy is that 9 per cent of the population will have 39 per cent of the accidents and that 39.5 per cent of the population will have 100 per cent of the accidents. This distribution is due solely to chance expectancy; there is no evidence of accident proneness.

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[1] These data have been computed by A. Mintz by means of the Poisson distribution or "law of small numbers."

If a deck of cards is dealt to four people it sometimes happens that one of them will get 6, 7, or more hearts instead of 3 or 4. Such a distribution is normally attributed to chance.

Statements to the effect that 10 per cent of a population has 30 per cent of the accidents or that 25 per cent have 75 per cent of them must be regarded as inconclusive unless the total population and the total number of accidents are known. Only when we have these figures can we establish the extent to which the distribution of accidents is due to chance expectancy and the extent to which other factors such as accident proneness enter.

An early study which is often referred to and which finds evidence for accident proneness was conducted by Greenwood and Woods (7). The data in this study are rather complete, which is more than can be said about many of the more recent studies. These authors develop the statistical formula based upon a theory of accident proneness and this must be recognized as a contribution. Table 27 presents some of the data from this study.

TABLE 27. Accident Distribution

Group	Total Population	Total Number of Accidents	% of People Having No Accident	% of People Having No Accident on Chance Expectancy
1.	750	432	53%	56%
2.	580	278	61%	62%
3.	648	303	68%	62%
4.	584	253	73%	70%
5.	414	200	71%	61%

If the principle of accident proneness is to be upheld, more people should have no accidents than would be predicted by chance. In three of the five groups this holds true but in the other two it does not. In the three groups where it does hold true, the percentages are 6, 3, and 10 per cent. These percentages are to be attributed to accident proneness in certain people but they must also be attributed to such other causative factors as length of employment, job hazard, training, etc. In any event, accident proneness as a cause for accidents is apparently not as formidable as some authorities have made it. Although Greenwood and Woods do establish the principle of accident proneness they do not indicate the degree to which it is responsible for accidents; many others who have done research in this field imply that the extent of accident proneness has been exaggerated.

Another erroneous use of accident proneness is seen in the arbitrary classification of people who have more than the average number of accidents as accident-prone. Such a method was used in the Cleveland Railway study, and at least one textbook defines accident proneness as being present in people who have two or three times as many accidents as the average person has. In Table 27, the average number of accidents per person is approximately 0.5; hence in an arbitrary classification a person having one or two accidents would be accident-prone. This is not necessarily true. The hypothetical situation previously mentioned shows clearly that some people may have two or three accidents solely on the basis of chance expectancy. This critical attitude toward the concept of accident proneness is in part supported by articles by Cobb (*2*) and Johnson (*9*). More work along these lines should be encouraged.

Accident proneness as a means of understanding the occurrence of accidents is useful provided that we recognize clearly that the human factor and the physical environment may contribute to accidents in the absence of accident proneness.

Drake (*5*) has proposed an interesting theory to explain the influence of accident proneness. According to him, "Where the perception level is equal to, or higher than the motor level the employee is relatively a safe worker. But where the perception level is lower than the motor level, the employee is accident prone and his accident proneness becomes greater as this difference increases."

Drake demonstrated the feasibility of this theory in a study made on a group of factory workers. He gave them three motor or manipulative tests and two tests of visual inspection and sorting. The raw scores were converted into percentiles and the difference in motor level as compared with perception level was obtained. The study showed that employees who were faster on the motor tests than on the perception tests had more accidents, and, conversely, that those who were faster on the perception tests than on the motor tests had fewer accidents. Drake reports that selecting new employees for comparable tasks on the basis of performance on these tests reduced accidents 70 per cent. He believes that this theory is applicable to all types of accidents including automobile accidents. Although the present author does not know of any check on these claims, he regards them as interesting. However, an obvious limitation of this theory is the lack of consideration given to the individual's personality and to contributing emotional factors.

ACCIDENT REDUCTION

Raising a question as to the importance of accident proneness does not mean that we should take the fatalistic attitude that little can be done to reduce the number of accidents caused by the human factor. Nothing could be further from the truth. The fact that accident distribution is in part determined by chance means that many unrelated factors are operating, not that accidents do not have causes; it means that there are multiple causes and all of them must be considered. The principle of accident proneness merely gets at one of the causes, i.e., the human factor in individuals who are accident-prone. The human factor must also be considered in accidents to individuals who are not necessarily accident-prone. The environment, the physical factors of machine design and wear, and innumerable other factors must also be included. Recognizing that there are many factors which contribute to an accident and considering differences in accident proneness as a minor rather than a major factor will make it possible to accomplish more in reducing accidents. Even a person who is accident-prone can cut his accident record by attacking the other factors which contribute to his accidents. Many people who are not accident-prone may have one or more accidents. These people too can reduce their accidents by altering the physical conditions conducive to accidents. For example, accidents are reduced by the installing of safety islands on heavily traveled roads and the provision of safety guards on moving machinery.

There are two approaches to accident reduction as related to the human factor. The first is usually referred to as the clinical method and the second involves educational campaigns that appeal to groups.

A good example of the clinical method is the tremendous amount of work De Silva has done in the field of automobile accidents; his book, *Why We Have Automobile Accidents*, is a scholarly presentation and positive attack on the problem (3). De Silva believes that the safe and efficient flow of motor transportation depends primarily on the individual behind the wheel and that there is a crying need for constructive supervision of the driver. He proposes four factors to be considered in determining a driver's susceptibility to accidents: (1) "Exposure," or the number and relative danger of the hazards encountered; (2) speed of driving; (3) skill in handling the vehicle; and (4) safety-mindedness.

Exposure factors which contribute to accidents are night driving, week-end and winter driving, and driving during rush hours and in metropolitan areas. The human factor—i.e., age, sex, occupation, and experience—also constitutes exposure factors. De Silva believes that the "high-exposure" driver should not be allowed to use the highways unless he can drive better than the average driver. How

FIG 31. Moving Road Scene Driver Test Apparatus (Reprinted by permission from *Public Health Bulletin No 265*)

this could be enforced is difficult to see; possibly retraining the "poorer-than-average" driver would in part remedy the situation.

Speed is a factor in accidents. De Silva reports that a group of drivers traveling over 50 miles an hour had 50 per cent more accidents recorded against them than a group driving at a moderate rate of speed (35 to 45 miles per hour). Speed affects maneuverability of the car and the distance traveled before stopping. Whereas at a rate of 20 miles per hour the average driver travels 21 feet while reacting to a stimulus indicating danger on the road, this distance is increased to 63 feet if he is driving at a rate of 60 miles per hour.

Skill in driving can be determined by road tests which measure the individual's experience and by apparatus tests which measure his driving aptitude. Apparatus tests can measure responses to complex or dangerous situations. The moving-road-scene apparatus (Fig. 31) is useful in measuring general motor aptitude; the driver's coordination, speed of reaction, and ability to carry on several activities at once are measured under simulated driving conditions.

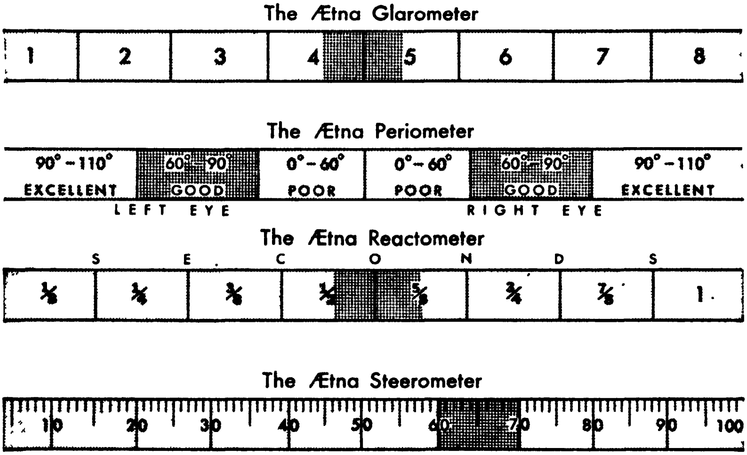

FIG. 32. Driver Reaction Score Card. (Tests used by the Aetna Life Affiliated Companies at the New York World's Fair in 1939.)

Other apparatus tests measure sensory abilities. The glarometer and the perimeter concern vision. The reactometer measures reaction time and the steerometer measures eye-hand coordination. (See Fig. 32.)

Safety-mindedness, according to De Silva, is a complex state of mind involving recognition of driving hazards and their relation to the lives of those on the road. The basic constituents of safety-mindedness are caution and consideration for the lives and property of others. Contributory characteristics are foresight, emotional stability, mental balance, and a desire to understand one's limitations as a driver with a view to surmounting them.

Automobile accidents can be reduced if drivers who are involved in more than one accident are required to take a traffic safety course which would acquaint them with any sensory or other defects they may have, teach them about road hazards, and inform them of any defects in their cars.

For years the Travelers Insurance Companies of Hartford, Connecticut, have been publishing booklets on auto accidents which should be distributed to every driver and pedestrian. Among the dynamic titles chosen for these booklets are the following:

YOU BET YOUR LIFE
SMASH HITS OF THE YEAR
HERE TODAY–GONE TOMORROW
THE WRECKORD

The figures gathered for these booklets are important; some of them are presented in Tables 28–35.

TABLE 28. Actions of Drivers Resulting in Deaths and Injuries

	Persons Killed	Per Cent	Persons Injured	Per Cent
Exceeding speed limit	9,460	42.4	230,760	27.1
On wrong side of road	3,410	15.3	120,060	14.1
Did not have right-of-way	2,970	13.3	194,140	22.8
Cutting in	270	1.2	25,550	3.0
Passing standing street car	20	0.1	1,700	0.2
Passing on curve or hill	80	0.4	2,550	0.3
Passing on wrong side	450	2.0	14,480	1.7
Failed to signal and improper signaling	530	2.4	71,530	8.4
Car ran away—no driver	40	0.2	1,700	0.2
Drove off roadway	1,120	5.0	22,140	2.6
Reckless driving	3,500	15.7	148,160	17.4
Miscellaneous	450	2.0	18,730	2.2
TOTAL	22,300	100.0	851,500	100.0

TABLE 29. Actions of Pedestrians Resulting in Deaths and Injuries

	Pedestrians Killed	Per Cent	Pedestrians Injured	Per Cent
Crossing at intersection:				
With signal	290	2.9	10,320	6.0
Against signal	780	7.7	20,970	12.2
No signal	1,190	11.8	19,770	11.5
Diagonally	180	1.8	2,920	1.7
Crossing between intersections	2,770	27.5	46,770	27.2
Waiting for or getting on or off street car	40	0.4	1,020	0.6
Standing on safety isle	20	0.2	340	0.2
Getting on or off other vehicle	110	1.1	2,410	1.4
Children playing in street	870	8.6	21,660	12.6
At work in road	240	2.4	3,950	2.3
Riding or hitching on vehicle	140	1.4	2,240	1.3
Coming from behind parked car	840	8.3	20,970	12.2
Walking on rural highway	1,960	19.5	7,740	4.5
Not on roadway	360	3.6	8,250	4.8
Miscellaneous	280	2.8	2,580	1.5
TOTAL	10,070	100.0	171,910	100.0

TABLE 30. Weather Conditions Prevailing in Accidents

	Fatal Accidents	Per Cent	Non-Fatal Accidents	Per Cent
Clear	26,020	85.6	710,400	81.9
Fog	580	1.9	11,280	1.3
Rain	3,250	10.7	120,570	13.9
Snow	550	1.8	25,150	2.9
TOTAL	30,400	100.0	867,400	100.0

TABLE 31. Sex of Drivers in Accidents

	Drivers in Fatal Accidents	Per Cent	Drivers in Non-Fatal Accidents	Per Cent
Male	37,300	95.4	1,201,540	91.4
Female	1,800	4.6	113,060	8.6
TOTAL	39,100	100.0	1,314,600	100.0

TABLE 32. Road Location of Automobile Accidents

	Persons Killed	Per Cent	Persons Injured	Per Cent
Between intersections	9,260	27.3	443,780	34.1
Rural intersections	1,320	3.9	50,580	3.9
Highway	11,080	32.7	248,180	19.0
Driveway	570	1.7	22,050	1.7
Curve	3,150	9.3	61,090	4.7
Street intersections	6,000	17.7	455,000	34.9
Railroad crossing	2,110	6.2	7,500	0.6
Bridge	410	1.2	13,820	1.1
TOTAL	33,900	100.0	1,302,000	100.0

TABLE 33. Condition of Motor Vehicles Involved in Fatal and Non-Fatal Accidents

	Vehicles in Fatal Accidents	Per Cent	Vehicles in Non-Fatal Accidents	Per Cent
In apparently good condition	36,000	91.7	1,257,750	95.2
Brakes defective	1,060	2.7	23,780	1.8
Steering mechanism defective	350	0.9	6,610	0.5
Glaring headlights	40	0.1	1,320	0.1
One or both head-lights out	430	1.1	6,610	0.5
Tail-light out or obscured	160	0.4	3,960	0.3
Other defects in equipment	710	1.8	11,890	0.9
Puncture or blowout	510	1.3	9,250	0.7
TOTAL	39,260	100.0	1,321,170	100.0

TABLE 34. Hours of Occurrence of Accidents

	Persons Killed	Per Cent	Persons Injured	Per Cent
12 to 1 A.M.	1,760	5.2	46,870	3.6
1 to 6 A.M.	5,480	16.2	128,880	9.9
6 to 7 A.M.	470	1.4	14,320	1.1
7 to 8 A.M.	750	2.2	29,950	2.3
8 to 9 A.M.	640	1.9	39,060	3.0
9 to 10 A.M.	710	2.1	39,060	3.0
10 to 11 A.M.	980	2.9	48,170	3.7
11 to 12 A.M.	1,190	3.5	59,900	4.6
12 to 1 P.M.	780	2.3	59,900	4.6
1 to 2 P.M.	1,150	3.4	58,590	4.5
2 to 3 P.M.	1,220	3.6	69,010	5.3
3 to 4 P.M.	1,700	5.0	82,020	6.3
4 to 5 P.M.	1,870	5.5	102,860	7.9
5 to 6 P.M.	2,240	6.6	109,370	8.4
6 to 7 P.M.	2,110	6.2	84,630	6.5
7 to 8 P.M.	2,410	7.1	76,820	5.9
8 to 9 P.M.	2,200	6.5	71,610	5.5
9 to 10 P.M.	2,070	6.1	63,800	4.9
10 to 11 P.M.	1,970	5.8	55,990	4.3
11 to 12 P.M.	2,200	6.5	61,190	4.7
TOTAL	33,900	100.0	1,302,000	100.0

TABLE 35. Days of Occurrence of Accidents

	Persons Killed	Per Cent	Persons Injured	Per Cent
Sunday	6,270	18.5	208,320	16.0
Monday	4,100	12.1	170,560	13.1
Tuesday	3,760	11.1	165,350	12.7
Wednesday	3,760	11.1	164,050	12.6
Thursday	4,410	13.0	169,260	13.0
Friday	4,750	14.0	192,700	14.8
Saturday	6,850	20.2	231,760	17.8
TOTAL	33,900	100.0	1,302,000	100.0

These eight tables tell the following story:

1. Speeding is the greatest single cause of deaths and injuries. It accounts for 42 per cent of the deaths and 27 per cent of the injuries.
2. One-quarter of the deaths and injuries of pedestrians is caused by crossing between intersections.
3. Most accidents occur in clear weather.

4. "At first glance the figures covering accident experience of male and female drivers in 1946 would seem to settle once and for all the question as to whether women are better or worse drivers than men. The weight of evidence is all in favor of the women!

   "Actually, no country-wide figures are available to tell us how many more male drivers there are than female drivers, how much more mileage the average male covers in a year than does the average female, or the relative traffic hazards which each sex faces.

   "Studies have indicated that on a typical day, men account for about eight times as many 'Car miles' as women, that men drive faster on the average (partly from necessity, as in the case of men using their cars for business purposes) that men often are forced by the nature of their business to drive when weather and road conditions are at their worst, and that men do more of their driving in the congested, hazardous areas.

   "Until more data become available, it will be impossible to compare the safe driving abilities of men and women."
5. One-third of the deaths resulting from automobile accidents occurred on the highway. Two-thirds of the injuries were sustained at or between intersections.
6. Most cars involved in crashes are apparently in good condition.
7. The hours between 5 and 8 P.M. are the most hazardous. People hurrying home from work as darkness falls may explain this.
8. Saturday is the worst day for auto accidents.

Accidents can be reduced not only by clinical studies of the accident-prone employee but by safety education conducted by management and employee groups. Foremen's meetings can be effective in reducing accidents, as Fig. 33 indicates.

Accident prevention in industry is the responsibility of both labor and management. The United States Department of Labor has issued a pamphlet (*15*) called "Guide to Industrial Accident Prevention Through a Joint

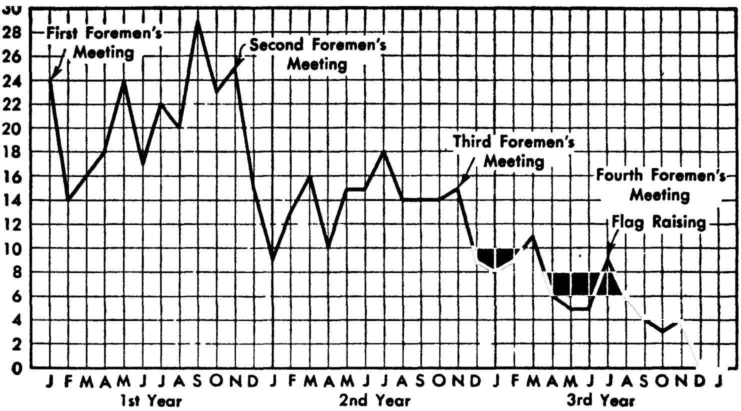

FIG. 33. Foremen's Meetings Reduce Accidents. (Courtesy of the Metropolitan Life Insurance Company.)

Labor-Management Safety Committee," which suggests an eight-point program for a safety committee:

1. Make immediate and detailed investigation of accident reports.
2. Develop accident data to indicate accident sources and injury rates.
3. Develop or revise safe practices and rules to comply with plant needs.
4. Inspect the plant to detect hazardous physical conditions or unsafe work methods.
5. Recommend changes or additions to protective equipment and devices to eliminate hazards.
6. Promote safety and first aid training for committee members and workers.
7. Participate in advertising safety and in selling the safety program to workers.
8. Conduct regular scheduled meetings.

SUMMARY

A STUDY of accident records reveals that some people have few or no accidents and others have many. The fact of such a distribution of accidents has led to the misunderstanding and overemphasis of the principle of accident proneness. When more people are found to have more accidents than normal chance expectancy indicates, the existence of accident proneness can be recognized.

There are many causes of accidents; they include the physical factors in the environment as well as the human factor.

The psychologist is interested in accident reduction in terms of the human factors which contribute to accidents. There are two approaches to this problem. The clinical method emphasizes the study of the individual; safety education involves the group.

On the basis of his study of automobile drivers involved in accidents, De Silva believes that four factors determine a driver's susceptibility: exposure, speed, skill, and safety-mindedness. He favors the clinical approach in studying these drivers and the use of apparatus tests which measure driving aptitude.

Safety training programs, provided they are the responsibility of both management and employee groups, can help to curb the accident rate.

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13. Leadership

ANOTHER type of problem to whose solution the industrial psychologist can contribute is leadership. The role of leadership in industrial relations is gaining increasing recognition. Just as society looks for a leader to define its purpose and lead it forward, so both management and labor have been concerned in the selection and development of men who can successfully attack the many perplexing problems that confront them. The psychological aspects of effective leadership and of the training of leaders deserve serious thought.

We all know that leadership is necessary in any group. In the industrial setting, either the employer or the employees will choose the leader. In the ideal situation both select the same individual. However, this does not often happen; the leader who is selected and the one who emerges from the group will have very different characteristics. If the leader is hand-picked by management, his loyalties will be predominantly to management and his characteristics may be such as to encourage conflict rather than cooperation. By the same token, if the group chooses a leader, his loyalties may lie solely with the group, and the result may be conflict rather than cooperation. The militant labor leader is undoubtedly a product of the conflict between management and labor; when these two groups learn to cooperate, such a person will no longer be a successful leader.

Effective selection depends upon management's understanding of leadership and its ability to evaluate men. For its purposes leadership may be classified at three levels: top management, middle management, and the front line. Top management usually means the "Big Boss"; middle management is just called the "Boss"; front line management includes foremen and supervisors who are usually referred to as "boss men" or "lead men." These three types of leaders operate on different levels and so they have different responsibilities and duties. Nevertheless, all three face basically the same problem—how to deal with and lead people.

A leader who loses contact with his group is no leader; hence it is important for any executive who serves as a leader to remember that he must maintain close contact with his group if he is to function as a leader. It is also important that he be able to delegate authority. Many leaders fail not because of limitations on their own general ability, but because of their inability to delegate authority. Leadership is not a one-way affair; rather it involves interaction of the leader and the group.

Barnard *(2)* says that executive work has three aspects: communication, cooperation, and purpose. The executive is responsible for devising a system of communication which will allow the organization to function smoothly. Since the executive is always concerned with securing services from individuals, he must show a strong willingness to cooperate with people. The executives formulate the general purposes of the organization, and they must indoctrinate their subordinates with these general purposes so that the organization will function in a unified manner.

CONDITIONS FOR EFFECTIVE LEADERSHIP

DOUGLAS MCGREGOR *(11)* approaches the problem of leadership through the subordinate-superior relationship. The outstanding characteristic of this relationship is the subordinate's dependence upon the superior for the satisfaction of his needs. Psychologically, this dependence has great significance because of its emotional similarity to the child's earlier dependence upon the parents. The subordinate's dependence has two results: the necessity for security and the necessity for self-realization.

The subordinate frequently regards the actions of his superiors as sources of threat; conversely, conditions which encourage a feeling of security in him lead to more efficient functioning. Effective leadership attempts to remove the conditions of threat. The three major aspects of the subordinate-superior relationship at any level which affects the security of the subordinate are atmosphere, knowledge of what is expected, and consistent discipline. When the superior creates a favorable atmosphere rather than one of tension, the subordinate feels secure. The creation of this atmosphere is closely related not so much to what the superior does as to how he does it. If the atmosphere is favorable and trusting, orders and rules will not be questioned nearly as much as when the atmosphere bristles with tension and uncertainty.

An effective leader makes certain that his subordinates know company policy and philosophy. He familiarizes them with company rules and regulations. The employee's job is clearly defined so that he understands his duties and responsibilities as well as his place in the organization. The effective leader creates a feeling of security in the employee by letting him know exactly how he stands. Some employees feel insecure because, although they believe they have been doing a good job, the boss has never told them so.

Another quality of a good leader that promotes a subordinate's security is his ability to take the employee into his confidence, especially in something that is likely to affect the security of the individual. Changes should not be made overnight; the employees should be informed in advance as to the reasons for the change and when it is likely to take place.

The third requirement for the subordinate's security is consistent discipline on the part of the superior. The employee should be in a position to predict what is expected of him so that, in turn, the actions of his superior will be predictable. He must be in a position to know when management will back him up; he will resent any buck-passing or being let down. A good leader is never concerned with the problem of maintaining discipline; consequently he need not worry about a subordinate's taking advantage of a situation. When the punishment for an infraction of the rules is known in advance and is meted out shortly after the incident and without favoritism, there is little likelihood of resentment being felt by anyone concerned. In a favorable atmosphere, mild discipline will usually prove sufficient. But if the atmosphere is unfavorable, the severest discipline will not achieve its purpose; on the contrary, it may encourage further infractions of the rules by a greater number of people.

In a subordinate-superior relationship which produces security, the subordinate individual shows a real need for independence. In other words, in a relationship involving a dependent individual, healthy encouragement of this dependence leads to his independence much more often than it does to further dependence. The person who has been made to feel secure in his dependent role will manifest his independence by actively participating in problems which concern him and by using the right of appeal. He has been encouraged to accept responsibility in his role and he shows this by giving his superior many ideas which, under unfavorable circumstances, he would not do. It is equally important for the subordinate in a subordinate-superior relationship not to be allowed to develop feelings of frustration. Many honest differences of opinion can occur in such a relationship and the subordinate must feel that he can appeal his superior's decisions—to a higher level of management or an employee grievance committee —without jeopardizing his own security and the harmony of the relationship.

Not all people want to be leaders. Many become extremely unhappy when they are vested with such responsibilities. It is important for the leader to recognize this so that he will not regard such an attitude as indicating lack of drive or ambition in a subordinate. It is equally important for people who do not want to be leaders to recognize that people who want to lead are not necessarily intent on taking advantage of others. In a democratic society, the person who attains leadership by this means is not truly a leader and will encounter considerable conflict with the group as well as with other leaders. The concept of status is also involved in leadership. Whereas some people gain considerable satisfaction from their higher status in the group, others derive equal satisfaction from being merely a member of the group and having no higher status than do the other members

RULES OF SUPERVISION

It is not at all necessary for a supervisor to be the arbitrary and dictatorial individual which many people believe him to be. In fact, considerable evidence presented in recent years indicates that this type of leadership is inefficient. Furthermore, the supervisor need not be incredibly dynamic, forceful, and aggressive. He just happens to be the person whom the group looks up to and respects.

One important rule for a supervisor is to listen patiently to what his subordinate has to say. He should never interrupt and he should manifest interest both in what is being said and in the individual who is talking.

A supervisor should never make hasty decisions, especially when they concern a subordinate's conduct. A superior who discourages his subordinate from talking to him will never find out the cause for a complaint. Effective supervision recognizes that most complaints have either an emotional or a factual basis. Even complaints which are purely personal and obviously beyond the realm of the supervisor and the company should be listened to. Although the supervisor may not be able to change the situation, the subordinate is often happier because he has "gotten it off his chest"; what is more, he decides that the supervisor is a "swell guy" because he has listened to him.

A supervisor must never argue with employees. Arguments are likely to create a feeling of insecurity and they serve to frustrate the employee because he may believe that he has no chance of winning. Orders can be issued without having them sound as if they were the culmination of an argument, even though there has been no argument.

Another important rule for the supervisor is always to voice disapproval in private, although praise may be expressed publicly. Being called down in front of other people—regardless of whether the criticism is warranted or not—is often much harder to take than the criticism itself.

COMMUNICATION

WITHOUT communication, effective leadership cannot be maintained. Any organization requires a system of communication in which orders and information can travel from higher to lower levels, and from lower to higher as well. Leadership is often limited by its inability to channel information correctly throughout the organization. Material that is transmitted down is usually referred to as an "order"; that transmitted from subordinate to superior is usually referred to as a "report." Order or report, both are important in the functioning of an organization and the smooth flow of work often depends upon their accurate and rapid transmission. It is the direct responsibility of the superior to devise an efficient system of communication and see that it is kept in operation.

Communication in an organization is effective when it meets a number of requirements. In the first place, the channels of communication must be known to all. Organizations function differently in this respect. At one extreme are the companies which require their employees to stay in line and communicate only with the employee immediately above or below them. At the other extreme are the companies which permit any employee to transmit communications to anyone else, regardless of position. Whatever the system, every employee must be familiar with it.

The system of communication must reach all the employees with dispatch. If a communication involving many employees is not received by all of them at approximately the same time, rumors will flourish and employees will feel insecure; they may decide that favoritism is being shown somewhere along the line. To avoid misunderstandings and make certain of correct transmission, the lines of communication should be as short as possible. The outstanding example of direct communication is the situation where the president of the company speaks over a loudspeaker system to all the employees. There is nothing like the feeling one has when he gets information "straight from the feed box."

According to Barnard (2), a person regards a communication as authoritative when four conditions exist simultaneously: (1) when he understands the communication; (2) when he believes it to be consistent with the purposes of the organization; (3) when it is compatible with his interests as an employee; and (4) when he is mentally and physically able to comply with it.

DO'S AND DON'TS

It is very difficult to devise a list of specific recommendations for the successful leader because such lists must be general in nature, whereas most situations which confront the leader are specific. A further difficulty is that while a person may memorize the list, there can be no guarantee that he will be able to apply the rules to the specific situation confronting him. In spite of this, it is nevertheless advisable to summarize the points made above by briefly listing what a leader *should* do and what he *should not* do.

A leader should base his actions on the following five principles:

Fair Evaluation of Work. A subordinate is constantly seeking an appraisal of his work; hence the superior should not hesitate to give praise or criticism periodically as well as whenever the situation calls for it. He should remember that people may be praised publicly, but that no one should be criticized publicly.

Sufficient Delegation of Authority. A "perfect executive"—if there were such a thing—would be a person who has no work to do himself because his subordinates do it for him. His function is to assign the work and see that it is done properly. But once the superior has delegated authority, he should back up the subordinate at all times. However, if the subordinate misunderstands or fails to carry out instructions, he should not be upheld to the detriment of the organization. Under such circumstances the delegation of authority should be changed. News of such changes should be communicated to the employees in advance.

Fair Treatment for All. The leader must remember that one employee is as important as any other employee, even though one may have higher status in the company. All people deserve and demand equal consideration. Regardless of status, every employee likes to feel that the company considers him important; he will resent being treated as if he were unimportant.

Availability to All Employees. The leader should be readily available to all employees. Just as it is his prerogative to send for a subordinate, so it should be the subordinate's prerogative to make an appointment with the leader for any cause he deems justified. The "Big Boss" in a large organization would do well to have one of the telephones on his desk connected directly with the main switchboard for employee use. The feeling that all the employees have an equal right to talk to the "Big Boss" often makes it unnecessary for an employee to call him. A leader who is readily available to his subordinates impresses them with his interest in their problems and thereby promotes a more effective subordinate-superior relationship.

Discussion of Employee Problems with Employees. Management should not make decisions concerning employees without taking the employees' wishes into consideration. Many times, taking subordinates into the leader's confidence has resulted in suggestions that have solved the problem more successfully. The feeling created in employees as a result of such a policy has outstanding rewards, not only for the employees but for management as well.

A leader should *avoid* such common practices as the following:

Dependence upon Superiority. Some people take advantage of their superior position; they believe that their orders should be obeyed simply because "I am the boss." A successful leader does not have to depend upon his superior position; rather, his superior position will be recognized.

Simulation of Knowledge. Subordinates are quick to estimate the ability of a superior; hence a wise leader will not try to make believe that he knows more than he really does. An effective leader is one who has the technical knowledge required by his job; subordinates will look up to such a leader. Sometimes they actually know more about the specific work they perform than the superior, for he is not expected to know all the intricacies of every job.

Interference with Work. A leader delegates work to his subordinates. Once this has been done, within reasonable limits he should allow the subordinate to finish the job by himself. Interference on his part is often resented; furthermore, it causes distraction. A leader must not interfere with the smooth flow of the work done by his subordinates unless he wants to curtail production.

Favoritism and Discrimination. The leader, as an individual, will probably like some of his subordinates more than others. However, in the work situation, he cannot allow these personal likes and dislikes to influence the distribution of work or to interfere with discipline.

Public Reprimands. A subordinate must maintain his self-respect, especially in the eyes of his fellow workers. Just as children should never be punished in the presence of their friends, so employees who are subject to disciplinary action should be told about it in private. A public reprimand often serves only to lower the position of the subordinate. The superior should not even raise his voice when talking to a specific individual in a group.

Pettiness. Subordinates expect a leader to be magnanimous. Harping on trivialities, continually going over minor details, and demonstrating in other ways that he does not respect the subordinate's ability often prevents a superior from maintaining harmonious relations.

Conflicting Orders. A leader must remember the orders he has issued. A subordinate is often confused when the leader, failing to remember a previous order, directs him to do something just the opposite. He is usually too embarrassed to call these conflicting orders to the leader's attention, but he usually decides that the leader does not know what he is doing. In some organizations lines of authority are not clear-cut, with the result that two people with equal status knowingly or unknowingly issue directly opposing orders. Such a situation can be avoided by establishing clear lines of authority.

Superfluous Orders. An effective leader is one who issues few orders rather than a great number. Unless orders are within the scope of his authority, can be clearly understood, and are possible to carry out, they will not be obeyed. Too many orders not only tend to undermine the leader's authority but also create insecurity in the employee and prevent the exercise of a healthy independence on his part. An effective leader does not find it necessary to issue many orders.

SELECTION AND TRAINING OF LEADERS

Selection. Psychological tests have been successful in the selection of many different types of employees, but to date they have not been of any great help in the selection of potential executives. If this problem is solved, as it may well be, the type of test will be vastly different from that used in selecting other employees. The value of psychological tests in employee selection will be discussed in Chapters 16 and 17, and we shall see then that tests can be used for this purpose when a job criterion is available. No criterion of success at the executive level has been unequivocally established.

Jenkins (*9*) has proposed the nominating technique as an approach to the problem of selecting executives. This technique is very similar to one proposed by Moreno much earlier, but Moreno did not have in mind the specific problem of industrial leadership. Jenkins' original purpose was to obtain information on the "combat suitability" of naval aviators, but he soon realized that this study was producing interesting data on leadership.

Interviews were held with naval pilots, the conversations being centered about the following two questions:

> Assume that you are to be shifted to a new air group tomorrow and that you may select your own combat-mates to go with you to this new air group. Of all the men known to you in Naval Aviation—living or dead—what two men would you like

most to fly wing in your new combat assignment? Why would you select these men?

What two men would you least like to have flying wing on you? Why?

The pilots' selections showed diagrammatically the difference between the formal leadership imposed by chain-of-command and the informal, functional leadership set up by the men themselves. The squadron commander in one squadron was not nominated once; the executive officer received multiple nominations, but they were all negative. There were many small cliques in this squadron and all the "not-wanted" nominations were men within the squadron. This squadron was recognized as having low morale and the nominating technique showed the absence of leadership.

In another squadron known for its high morale and excellent combat record, the diagram resulting from the nominating technique was very different. The squadron commander was named most frequently as "wanted in combat"; the executive officer was the second most desired combat-mate. There was no evidence of subgroups and more than 50 per cent of the "not-wanted" nominations were men outside the squadron. In this squadron the man who ranked third was a lieutenant, junior grade. Jenkins points out that if this young lieutenant were to become a leader solely on the basis of seniority, it would take an unwarranted length of time for his leadership to be utilized.

Many people believe that the best way to detect potential leadership is to find a man who already has followers. The nominating technique can do just that.

Jenkins recognizes that this technique cannot be used indiscriminately. He believes that the following five conditions are a prerequisite for its success:

1. The tasks involved represent high levels of skill.

2. The motivation to do well is in proportion to the cost of failure.
3. The same basic skills are required of all members of the group.
4. Individual members have firsthand knowledge of the performance of the other members.
5. The group has been closely associated over a long period of time.

It appears certain that when a group selects its leader, it does so not on the basis of popularity or personality but on the basis of a rather critical evaluation of all its members. Superimposing a leader on an already formed group may do much to change the general atmosphere. Such findings as these support the policy of promotion from within the ranks and even suggest that the group can aid in selecting the individuals to be promoted. Management should not forsake its accepted role of selecting the leader; but when, in selecting, it fails completely to consider possible candidates among the employees, its choice may not be very successful. It is possible, of course, that a group will be unable to reach a decision as to which member will make the most efficient leader, and under these circumstances management will have to bring in someone from the outside.

Training. A very effective means of training a leader is by means of the technique variously called "reality practice," "role playing," or "the problem approach." A realistic problem is presented and the subjects are required to act out a solution to it. For example, a group of foremen who are being trained in effective leadership may be presented with the problem of an employee's infraction of a company rule. Rather than allow discussion on an unrealistic basis, one of the foremen is asked to play the role of the employee and another to take the role of the foreman. The two men set the stage by planning their handling of the problem, and then they act out the situation before the group. Afterwards, the group discusses the problem, paying special attention to what they consider mistakes made by the two foremen. The performance is then repeated; two other men play the two roles to see if they can avoid the mistakes made in the first presentation. Again there is group discussion, the members trying to determine which solution was the better and also to analyze the behavior which led to this solution.

In a variation of this technique, one man takes the role of the employee who has broken the rule; he is confronted by three different foremen, none of whom knows the approach used by the other two. The group then decides which was the best way to handle the situation or what particular aspects of each technique would contribute most to the solution. The three foremen are asked to repeat their performances, modifying them according to the suggestions of the group.

This type of training encourages learning at a very meaningful level. The person in charge of the training has a passive but nonetheless important part. It is up to the group to choose the problems which are of greatest concern to them; the leader must encourage active participation. At best, he can steer the discussion but he can never really direct it; therefore the spontaneous aspects of the training are allowed to emerge.

French (*8*) reports that in training foremen to handle interpersonal relations role playing has a number of distinct advantages over the more conventional methods of lectures, conferences, reading, and discussions. Role playing provides an excellent bridge between discussions of interpersonal relations and their actual handling. In addition, it presents test situations to determine how well a trainee can handle various problems, and it makes the leader more sensitive to different methods and styles of leadership.

An illustration of role practice as a means of training foremen is presented below. Here the problem was to increase an inefficient factory operative's production; the quotation shows how three people attempted to handle it.

Foreman (*getting up reluctantly and going over to girl at the desk*). Well, Dottie, you only made 30 units yesterday. Did you have any special trouble? After I brought you all your work, too.

Girl. I didn't feel good.

Foreman. Did you have any machine trouble or anything?

Girl. Yes, I did.

Foreman. Well, why didn't you put your little red light on?

Girl. I don't know. I guess I forgot. And the thread breaks all the time.

Foreman. Well, you should tell me about those things so I can help you. You'll do that after this, won't you? And you'll try to do better too, won't you?

Girl. Yes, but I don't know if I can. It's hard to do.

Trainer. That's fine. Now let's talk about these two cases.[1]

The discussion continues with suggestions for using check studies and giving additional training. When the group is discussing "making excuses," the personnel manager, Mr. Jones, thinks that the supervisor should find out whether the girl has any personal problems. Because the trainer knows that this foreman has created resentment by prying into the personal affairs of her girls and because he wants to criticize the argumentative technique without criticizing her personally, he sets up a special situation.

Trainer. Let's see how Mr. Jones would tackle this problem. I'll be the girl, the same girl as the last time. (Sits at the *"machine."*)

Mr. Jones. Well, it just seems to me this way. There's lots of things that might be holding the girl back. Possibly she got a letter from her boy friend that had bad news in it, or something like that.

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[1] From J. R. P. French, in S. D. Hoslett (ed.), *Human Factors in Management,* copyright, 1946, by Harper & Brothers.

Trainer. Well, let's try it out and see how it works.

Mr. Jones (*getting up from his chair*). What did you say your name was?

Trainer. Dottie Sholley.

Mr. Jones (*now acting the role of supervisor*). I have some bad news for you here, Dottie. It seems you have fallen down a little in your units. What seems to be the trouble?

Trainer. Well, I didn't feel so good.

Mr. Jones. But when you asked me to be your supply girl you seemed to be feeling well enough.

Trainer. Well, I got some machine trouble and that slows you up. And these old threads break all the time. You can't do much when that happens.

Mr. Jones (*pauses for a moment*). Did you go to the show last night?

Trainer. No.

Mr. Jones. Anyone in your family sick?

Trainer. No.

Mr. Jones. Did you have a date last night?

Trainer. No, I'm married.

Mr. Jones. And you say you haven't been feeling well?

Trainer. No, I wasn't feeling well, but that was yesterday.

Mr. Jones. You don't feel sick most of the time?

Trainer. No, that was just a little stomach trouble. There's nothing wrong with me.

Mr. Jones (*laughing*). You're sure bucking me. I give up!

Bill. If you let them get into an argument with you, you'll never get out. They answer and answer and answer.

Trainer. Thanks. I certainly was being a tough one. Now let me give you my reactions. When you came up saying you had bad news I felt nervous. I didn't like that, so I was sort of on the defensive. I was thinking, now what am I going to say? I thought of something, and then while I thought of that I thought of something else to have ready for the next question. Then he asked me about my family and that scared me. I thought maybe something was wrong. Then he asked me if I had had a date, and I was married. That made me so mad that I nearly slapped him. And when he asked me again about my health, I tried to assure him that I was in good health because I was afraid maybe he would fire me if he thought I was sick all the time. Now, this is the toughest kind of case you will get. A girl who doesn't do what she can do, and you just can't find out why. Now would you like me to try the skunk oil method?

Bill. Yeah, I think so.

Trainer. O.K. You be the girl, Bill.

Bill. Sure, I'll answer your questions.

Trainer. You try to be the same girl that Anne was and that I was. Be as tough as you want to.

Bill. O.K. (*Sits down at the table.*)

Trainer (*approaching Bill with the sheet in his hands*). Hello, Dottie. Here's the unit sheet for today. Let's see, where is your name? (*Turning the sheets with Bill's help.*) I guess it's over on another page. What have you been doing?

Bill. Well, I made 30.

Trainer. How does that compare with what you've been doing? Is that good for you or not so good?

Bill. Well, I have done better.

Trainer. How long have you been on the job?

Bill. About six weeks.

Trainer. Well, it usually takes a girl three or four months to make 60. You say you have done better?

Bill. Yes.

Trainer. Have any trouble yesterday?

Bill. Yes, the thread breaks all the time. And I had such little bundles. I had to get more all the time.

Trainer. Oh, I'm sorry. I told you yesterday I was going to bring you a lot.

Bill. But they're too little. You run through them in no time.

Trainer. What you want to do is not worry about your progress one day or another day. How much do you suppose you will make a week from today? Maybe you'll get some small bundles and maybe your machine will give you trouble, but counting that in, what do you suppose you will make in a week?

Bill. I don't know. I might make 40 or 45.

Trainer. You think you could make 40 or 45! Why I've known girls who have taken three or four weeks to get up there from 30! What's the best you have made?

Bill. I think it's 48.

Trainer. Well, maybe you could then. How'd you like to try and make 40 by next Friday?

Bill. You mean just do 40 by next Friday?

Trainer. Yes, that gives you a good chance in spite of machine trouble and those things that you can't help that come up. Do you think you could do it?

Bill. I believe so.

Trainer. Now I don't think you can do it if you have troubles that aren't your fault. Now on the matter of thread breaks, sometimes that's the way you hold your cloth and sometimes the trouble is with the machine. When you get trouble like that, we can call the mechanic in or we can get the trainer over to see what's wrong. You want to have perfect working conditions. I'll come over Friday to see if you have made it, and I'll come around every other day, too, to see if I can help in some way. (*End of role playing.*)

Mr. Jones. Fine!

Trainer. I don't think I did that very well, but I was trying to use a different technique. Now what's the difference?

Mr. Jones. Well, you weren't on the defensive all the time.

Trainer. You mean Bill didn't put me on the defensive?

Bill. What he means is when you were the operator you answered him back. And I could answer all your questions to me this time, but there never was any blame on me.[2]

A detailed discussion continues for fifteen minutes on how to avoid arguments, putting a person on the defensive, the use of production goals, why the trainer used the *lower* of the girl's two estimates as the goal, etc.

SUMMARY

THE problem facing all levels of leadership is basically the same—how to deal with and lead people. Leadership is not a one-way proposition; rather, it involves a subordinate-superior relationship. The subordinate is dependent upon the superior for security. Conditions which produce security in the subordinate also encourage independence in him.

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[2] *Ibid.*

The leader need not be arbitrary or dictatorial; such a person does not obtain maximum respect from the group. The rules of supervision center around treating all members of the group fairly. The leader should set up an effective system of communication.

The nominating technique shows promise as a means of selecting leaders. Role playing is a valuable method of training leaders in interpersonal relations.

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14. Industrial Warfare

THE extent of industrial conflict and warfare concerns people in all walks of life. It has been crystallized by the clash of the interests and desires of various groups. Even though some people claim that the interests of employers and employees are basically the same and that there is no need for conflict, the extent of the conflict indicates either that this claim is not justified or that many employees and employers do not regard it as valid.

The growth and complexity of our industry have increased to such an extent that people are faced with a very real problem in finding a way to live. The technological advances in science and industry have been vast; it almost seems as if an inverse relationship exists between them and the advances in human relations. It is imperative that the latter catch up with the technological advances. Industrial psychology can help to achieve this objective. It applies to everyone in industry, employer and employee alike, and also to the organizations and groups these individuals form.

One reason for industrial strife in this country is the contest between management and organized labor for prestige in the eyes of the workers. Some employers believe that their employees need not join a union in order to get a square deal and for this reason they resist such activity when it occurs. This type of employer often regards unionization on the part of his employees as an act of desertion. He believes that unions foment trouble and drive a wedge between the company and its employees. Some unions, on the other hand, regard any attempts by management to improve employee welfare as an attempt to weaken the union or to prevent unionization. They believe that only through union action can the true interests of the worker be served.

The controversy concerning the closed shop is a good illustration of two different ways of looking at the same thing. The employer regards the closed shop as a violation of individual rights. He insists that the individual employee is not free to make up his mind about joining a union; he *has* to join. The union, on the other hand, believes that the closed shop is necessary if the union is to continue in existence and that all employees should contribute equally to it because they all benefit equally. Each side insists that the other maintains an intolerable position.

Even employee discipline is a cause for conflict. The employer in the past considered that this was his prerogative. The union, in its anxiety to protect its members, insists that discipline must not be unilateral, but that it, as the representative of the employees, should be consulted. To argue whether or not this is an infringement of the rights of management will not solve the basic difference. In other words, in the present stage of our industrial culture, individuals belong to groups, and these groups frequently believe that they have conflicting interests. This is the basis of our present-day industrial warfare.

WHY DO PEOPLE ORGANIZE?

IN OUR society, people are gregarious. This means that people *learn* to form groups. They learn that they as individuals gain economic, psychological, and social benefits through forming groups. It must be remembered that the interplay of these three forces is so great that it is exceedingly difficult to separate the economic from the social and these in turn from the psychological. People join the same group for a variety of different reasons. Whereas one person may join primarily for economic reasons, another may join primarily for psychological reasons, and still another for social reasons. As a rule, an individual does not differentiate among the three, and the ultimate reason he gives is usually nothing more than a rationalization.

For example, one political party may stand for a high tariff and another for a low tariff; some people will select their party on the basis of whether its tariff policy serves their economic interests. However, belonging to a political party has a psychological and social meaning to many people. Some may be active in their local political group primarily for social reasons—they like to play cards and there is an opportunity to do so when no campaign is under way. Others may belong to a political club primarily for psychological reasons. Being a member of the group offers an opportunity for self-expression. If he is the captain of the district, this often gives him much-needed prestige; he gains status in the community as an important local politician.

If we turn from the political club to the country club, where the emphasis is on social activities, we find the same interplay of these three forces. For some individuals, belonging to a country club may have real economic significance, for in addition to meeting the right kind of people they make many business contacts and close many transactions in its favorable atmosphere. The social reasons for joining a country club are obvious—one is accepted in the group he wants to join. Of course the individual psychological gratifications also play an important role.

Organizations run through our entire society; the family, the religious order, the political party, the manufacturer's association, and the union are all examples. People join any number of groups for many different reasons. Once the group is formed, it soon finds that direct appeals to individuals bring the greatest gain in membership. The union promises prospective members security, independence, and economic gain. The country club offers its prospective members desirable friends, favorable environment, and entertainment facilities. The trade association promises business information and group protection.

It is important to remember that a group can be no more than the sum total of the individuals in it; often it is much less. In other words, it is often run by a few individuals, and most of its members are quite content to have it this way. The group therefore takes on the character or personality of the few most active members. The possibility that some of these people may not be qualified for leadership is obvious. Nevertheless, they gain control, sometimes by political maneuvers, sometimes by showing greater willingness to work than others in the group, sometimes by force, but most often through the acquiescence of the other members. As the group develops its so-called "character" or "platform" it becomes a matter of rote rather than reason.

An industrial organization can be considered a group, just like any other group. This applies to a factory and to an association of manufacturers, employers, or employees, formal or informal.

A factor which should be recognized in any group is the function of status. Chester I. Barnard (*1*), president of the New Jersey Bell Telephone Company, has made some outstanding studies along these lines. According to him, all status systems result from the various needs, interests, and capacities of individuals. He lists five items in relation to the individual upon which these systems are based:

1. The differences in the abilities of individuals.
2. The differences in the difficulty of doing various kinds of work.
3. The differences in the importance of various kinds of work.

4. The desire for formal status as a social or organizational appeal.
5. The need to protect the integrity of the person.

Depending upon the needs of the individual, the importance of status and the character of the group are largely determined by the character of the group's leaders.

Organizations may be classified as authoritarian or democratic. One of the paradoxes of our society is our insistence upon political democracy and our neglect of industrial democracy. There is no doubt that democratic organizations serve the interests of the individual members to a greater extent than authoritarian organizations. The leader of the latter type assumes that he knows what is best for the members; he often feels contempt for them and believes them incapable of judging what is best for themselves. This type of leader drives hard to get things done; he regards immediate action, even if it requires force, as the outstanding measure of achievement. Authoritarian organizations tend to discourage individual initiative and impel the members to become dependent upon the benevolence or malevolence of the leader.

A democratic organization places more responsibility upon all the individual members, but the joys and satisfactions are distributed more evenly throughout the group. The following are some characteristics of democratic organizations:

1. They allow majority rule.
2. They permit free discussion.
3. They give equal importance to all members.
4. They do not make a fetish of status.
5. They do not frustrate individuals or subgroups.
6. They do not use power or force to gain objectives.

When an organization arrives at a decision as the result of the rule of the majority, providing that the majority is not dedicated to the persecution of the minority, we have the outstanding example of democratic organization. In order to reach this majority rule, it is important that ample and free discussion be held. The introduction of various rules of parliamentary procedure, especially in small organizations, often encumbers truly democratic action. The chairman of a meeting should see that the group has ample opportunity to discuss every aspect of all problems.

As Barnard says, status levels develop in any organization. However, it is important that all the members be regarded as having equal rights. Each member, regardless of his status, must be considered a free individual. A democratic organization should regard status as a temporary grant. An outstanding characteristic of authoritarian organizations is their tendency to adopt status symbols; uniforms, shirts, insignia, and other trivia are used to cover up their inadequacies. People who cannot gain importance in any other way or who are frustrated often take pride in the fact that they can wear a brown shirt or a white sheet; it is their only mark of distinction. Individuals who accept the "mark" give up their freedom and rights; they respond to forces from above and persecute blindly anyone they are told to oppose.

Majority rule, on the other hand, consciously attempts to avoid frustrating individuals or subgroups who do not conform with the majority. The fact that these people have different views is recognized, as well as their right to express their views. Sometimes, of course, the minority tries to obstruct the activities of the majority, but such tactics cannot be regarded as democratic. This situation, although difficult, can be handled in a democratic fashion.

An organization or its leaders sometimes become drunk with power and demonstrate this power by the arbitrary use of force. If we ever reach the height of civilization that most of us strive for, power and force will be recognized as unnecessary evils. No democratic organization, industrial or of any other type, should find it necessary to use its power or to exert force to control its members.

It is imperative that every member of any organization, regardless of its type, strive for its democratization. However, many people are so firmly enmeshed in authoritarian rule at the present time that progress is very slow. A dictator, whether he is a captain of industry or a labor czar, cannot be expected to yield power willingly. No organization that is not democratic, whether it is one of employees or employers, can serve the best interests of the people who belong to it.

EMPLOYEE ORGANIZATIONS

It is characteristic of our society for people with common interests and desires to form groups, and employees do just that. The groups formed by employees are both informal and formal in organization. Examples of informal organizations are the cliques which exist in the various departments of a company or in a union. An example of a formal organization is the labor union.

Unions, like any other organization, are formed because of economic, psychological, and social reasons. Some employees consider that they are at a disadvantage in bargaining with their employer. While they believe that one employee is as much an individual as one employer, they do not believe that one employee has as much power as one employer. Hence they group together in an effort to equalize the power. This often results in the employer's believing that he is at a disadvantage in bargaining with a group of employees, so he joins a group of other employers. Thus two opposing groups are formed and the conflicts between them are what we call industrial strife. Some employees believe that joining a union will give them a better opportunity to maintain the welfare of their respective families; they claim that hiring and firing should not rest solely in the hands of an individual employer. Others, on the other hand, believe that everyone must take his chances; they prefer to be free to work or not as they see fit.

Some employees also believe that membership in a union gives them an opportunity to develop more self-respect. The importance of this need must not be underestimated. Golden and Ruttenberg (7) in their admittedly biased but nevertheless dynamic book give many illustrations of this need. Their story of "Big Mike" is particularly pointed. "Big Mike" worked in the Pennsylvania Railroad Yard in Pittsburgh during the First World War. Workers, not jobs, were scarce then. In his twelve years with the road, he had never asked for a personal pass which permitted employees to ride free of charge. One day "Big Mike" decided to get a pass to visit some friends in Philadelphia. Dressed in his working clothes, he went to see his boss at noon. He broke into a conference in his boss's office and brusquely demanded a pass. The boss bawled him out vigorously, ordered him to get into clean clothes and come back in an hour and make his request properly. An hour later "Big Mike" quietly entered the outer room of the office, waited politely until the boss was available, and then presented himself in a gentlemanly fashion. "I'm back," he began in a low voice.

"Now, that's better," the boss said quickly. "You've come to get your pass to ride the road?"

"No, Mr. Roberts," said "Big Mike" calmly, "I've just come back to tell you to go to hell because I got a job on the B & O!"

"Telling the boss off" is often a compelling desire, and a person sometimes avails himself of an opportunity to do so when he believes that he has a group, such as a union, "in back of" him. This explains why striking workers often consider a slight raise in wages a victory despite the fact that the strike has put them and their families in debt—at least they had the satisfaction of seeing that the boss had to give in.

A rather different view as to why workers join unions is suggested by Temple Burling (2). He suggests that industrial workers, like everyone else, have a great deal of immaturity in their make-up. They have an inner eagerness to find parent substitutes. The boss, particularly the "big boss," is one of the convenient and obvious outlets for this emotional need. Unions were developed, according to Burling, as an economic weapon to fight other economic forces, but they have had another very important effect. They have given the working man a new relationship to satisfy his emotional needs so that he no longer needs a paternalistic employer. In other words, unions tend to take the place of the disinterested employer who serves as the economic father of the employee.

Many employers are surprised that their employees do not appreciate the various recreation facilities and special services provided for them. They regard this as an obvious sign of ingratitude and become soured toward employees as a whole. The trouble is that these employers do not understand that employees, as a rule, do not want to be babied and pampered and that they would appreciate these facilities if they had been allowed to take part in the decision to introduce them. The worker frequently questions the employer's paternalism and resents being treated like a child. The union thus serves a dual purpose so far as the individual employee is concerned. In the first place it becomes a more satisfying father-substitute than the employer, and in the second place it enables the worker to feel that he is accepted as an adult to a greater extent than a paternalistic employer sometimes considers necessary.

In discussing the impressionistic method of measuring attitude, reference was made to the Hershey Chocolate Corporation. We mention it again here to emphasize the fact that paternalism as such is neither good nor bad, but that it depends upon the needs of the employees and the way in which it is expressed.

The most immediate concern of the union should not be overlooked in searching for reasons why unions are formed. The most important function of the union is promoting collective bargaining. The individual employee's belief that he can bargain more successfully when he is represented by a group is a result of psychological, economic, and social factors.

HISTORY AND CHARACTERISTICS OF LABOR ORGANIZATIONS

For the rank-and-file worker, the process of unionization is a practical solution to the problems of an industrial environment. Union development in this country has never followed a master plan but rather has been characterized by trial and error. It has usually been opposed by those who believe in *laissez-faire*. Unions have been interpreted as opposed to the doctrines of free enterprise and free competition and as violating the right to freedom of individual contract. *Laissez-faire* believers also advocate non-interference by government; they oppose (or have opposed) minimum wage laws, child labor laws, compulsory accident compensation, and other labor legislation as interfering with the freedom of contract of individuals. It is for these reasons that unions have been considered un-American. The unions, on the other hand, have never admitted the "inherent right of individuals" in such matters; they have always maintained that freedom for an individual worker demands that he operate in a collective and cooperative manner. They consider standardization of employment contracts as a necessity and in no way un-American.

The present problems of labor and management have their roots in the origin of the wage-earning class which has a history of at least 150 years. To understand the labor movement in the United States it is necessary to realize that it stemmed from the Industrial Revolution in England. The far-reaching changes in economic, political, and social life starting about 1785 as a result of the invention of power machinery and its counterpart, the factory system, created misery among the working class. As their environment became more oppressive, workers were forced to organize. The early laws of England prevented this, but the repeal of the Combination Acts in 1825 led to the growth of unions.

In the United States the union problem was not as serious because of the lack of industrialization and the abundance of free land. The popularity of *laissez-faire* also played a role in limiting unions. Organization, when it did appear, took the form of local craft unions and was limited to a specific trade in a specific locality.

The earliest known labor strike in the United States occurred in 1786, when the Philadelphia printers, though not formally organized as a trade union, went on strike for a minimum weekly wage of $6. By 1825, hatters, tailors, weavers, cabinetmakers, and a few others had formed unions in their respective trades. The members were skilled workers and the unions had the characteristics of benevolent societies with their sick and funeral benefits. Unionization on a wider scale did not occur until the Civil War period. By 1870 there were 32 national unions.

Unions have had consistent ups and downs with periods of economic prosperity and depression. Two unions that survived the panic of 1873 and became important in labor history were the Noble Order of the Knights of Labor and the International Cigar Makers' Union, the latter the forerunner of the American Federation of Labor.

The Knights were idealistic and concerned with the union of all workers; they believed that all wage earners were concerned with each other's welfare. At first the

Order was a secret society with elaborate rituals, but in 1881 the membership was opened to practically everyone regardless of craft, skill, creed, sex, or color. Members of many professions and even employers were permitted to join. The few who were barred were bankers, lawyers, stockholders, gamblers, and those making or selling intoxicating beverages. This group increased its membership very rapidly. In 1885 it had 104,000 members and one year later the figure was 702,000. This rapid rise may have contributed to its downfall. In any event, a series of unsuccessful strikes resulted in a decrease in membership; by 1890 it had only 100,000 members and was disintegrating at a rapid pace. Reviewing the Knights' program, one is inclined to conclude that its centralized structure and its highly idealistic program were the primary causes of its failure.

Opposed to the Knights was the American Federation of Labor, founded in 1886. This was a loosely organized craft union movement in which autonomy of membership was maintained. It was based upon the idea that wage earners are primarily interested in working for immediate economic advantages. It assumed that the craft was the most satisfactory unit because the interests of workers were most closely bound up with those of others in the same craft. The basic issue between the Knights and the A.F.L. was whether the labor movement was to be idealistic or opportunistic. The A.F.L., who advocated opportunism, won. By 1920 this organization had four million members, but a period of relative stagnation then set in.

The advent of the New Deal and the National Industrial Recovery Act presented an opportunity for unionizing the citadels of the open shop—the automobile, steel, and rubber industries—by restraining the employers' anti-unionism. The National Labor Relations Act further protected collective bargaining. However, the A.F.L. with its craft orientation was not geared for such developments. In 1935, eight of its unions formed the Committee for Industrial Organization (C.I.O.) within the A.F.L. These unions represented over one million workers, or approximately one-third the total A.F.L. membership. The controversy as to whether unionization was to proceed along craft or industrial lines became so intense that in 1938 the C.I.O. broke its affiliation with the A.F.L. and became the Congress of Industrial Organizations. The unionizing vigor of the C.I.O. coupled with its different ideas on who was to belong to what union led to a civil war in labor.

THE ROLE OF THE GOVERNMENT

LABOR-MANAGEMENT relations have always involved the government as a third party. Both in England and in the United States, laws pertaining to labor have had a definite influence on the growth, trials, and tribulations of labor and, in turn, on management's behavior toward labor.

It is important to remember that government cannot be treated as an abstraction. Its role in labor controversies is determined by the people who make up the government. The elected officials most usually reflect the attitudes and beliefs of the economic and social class dominant at the particular time, because they come essentially from this class. It is also true that they most often represent the influence and power of the controlling group or class.

The New Deal served as a tremendous impetus to the growth of labor because its laws were favorable to labor. But the Labor-Management Relations Act of 1947 (Taft-Hartley Act) has swung the pendulum in the other direction. It has altered many provisions of the National Labor Relations Act of 1935 (Wagner Act). Two of the more important changes concern outlawing the closed shop and permitting unions to be charged with and found guilty of unfair labor practices. The Taft-Hartley Act has increased the rights of employers and narrowed their liabilities. For example, under it employers have no obligation to recognize or bargain with supervisors' unions, and employers have the right to sue unions for damages resulting from violations of collective contracts. This law is the most detailed, complex, and comprehensive national labor legislation ever to be enacted in the history of the United States. According to its proponents, it is designed to establish a power balance between employers and unions. According to its opponents, it is a "slave-labor act."

The point is that the law of the land at a particular time is not a reflection of any person's "inherent rights"; it is merely a reflection of the lawmakers' attitudes. In working for the passage or defeat of laws, organized labor and organized management may or may not indulge in politics. This is determined by organizational policy or the laws that the government passes.

As was true of the controversies in the past, those of the present and future will often be characterized by labor and management seeking the particular opportunistic advantage of the moment. Through public opinion or directly through government one group will exert pressure to have laws passed which best serve its partisan interests. At the same time the group that has little influence in government circles will insist that government must not interfere.

CONFLICT WITHIN THE RANKS OF LABOR

THE conflict between the C.I.O. and the A.F.L. is deep, and only a highly idealistic person who lacks the knowledge required to understand it ventures to seek unity. The obvious issue between the two is craft vs. industrial unionism. To begin with, the A.F.L. believed that the craft unions were the only ones likely to have a sufficiently strong common core to insure a permanent organization. The heads of the eight unions that originally formed the Committee for Industrial Organization wanted to launch strong organizing drives in non-union and mass-production industries in the belief that specialized and unskilled workers could be organized into a permanent union. In addition, these men were dissatisfied with what they considered the structural and functional inadequacy of the A.F.L. and its alleged incompetent leadership. Those who favor industrial unions insist that craft unions cannot organize the large industrial corporations and that the only effective means to this end is an equally large-scale industrial union. They maintain that the interests and needs of the workers throughout an entire industry are similar.

In line with its traditional view that dual unionism is intolerable, the A.F.L. originally regarded the C.I.O as an upstart and a rebel to be dealt with sharply. But as the C.I.O program for unionization unfolded and proved to be successful, the A.F.L. has tended to veer from its original advocacy of craftism. The C.I.O in turn has found that in many situations vertical unionism is not always the answer and some of its large unions have cut across industrial lines.

The weakening of their original position has only served to intensify the split between the two unions. The presence of rival unions in the same and overlapping fields presents new and more difficult problems in the way of unification. In addition, the difference in their attitude toward politics must also be considered. The C.I.O has promoted political activity, whereas the A.F.L. has not been too happy about government activity in the labor field. Although the C.I.O. is not a Communist organization, the A.F.L. has frequently made such charges, especially against some left-wingers on the C.I.O. general executive board. The A.F.L. will not consider unity while these men are active. In turn the C.I.O. accuses the A.F.L. of harboring and encouraging labor racketeers and autocratic leaders.

The leadership in these two groups takes a different character. The A.F.L. is controlled by older men who have spent many years in the upper labor circles. As individuals they belong to either the Republican or the Democratic party and will not allow the Federation to affiliate with either party. As men they are somewhat conservative and in some instances do not see the necessity for real activity on the part of their members. Some have become entrenched in autocratic one-man control. The C.I.O on the other hand is a younger organization. Many of its leaders are younger and not as staid. They are interested in education and member activity. They are active politically and are likely to be more liberal than conservative.

The competition between these two giant labor organizations has led to some jurisdictional disputes but not nearly as many as might be expected. For example, jurisdictional and rival union strikes in the United States in 1940 and 1941 amounted to 6.3 per cent of the total strikes. This figure dropped to 3.3 per cent for 1944 and 1945 (*12*). It may well be that such figures reflect the recognition on the part of labor that it cannot accomplish much by fighting itself.

Both organizations have rather similar structures and both have an opportunistic rather than idealistic approach. Both are business unions. Some day when the time is ripe, combination may be feasible; but for the present it is most realistic to regard both as separate powers that are making important contributions in behalf of labor.

EMPLOYER ORGANIZATIONS

EMPLOYERS form groups just as employees do. In fact, there are over two thousand employer associations in the United States concerned in one way or another with labor matters (*5*). The history of employer associations is about as old as the history of unions, for one of the earliest associations to appear was the Society of Master Cordwainers which was formed in Philadelphia in 1789. Employer associations gained real prominence after the Civil War; the General

Managers Association formed by twenty-four railroads to fight strikes exemplifies the belligerent type of organization that emerged. The National Association of Manufacturers was formed in 1895 and adopted actively belligerent policies in 1902.

Whereas some employer associations have been concerned with problems other than labor and some have been conciliatory toward labor groups, many have been directly involved in labor-management controversies.

It is claimed that the growth of unions has been such that the balance of power has shifted from employer to employee; hence, in order to equalize the various factors, management organizations have taken the place of the individual owners of business. For example, Henry Van Hoevenberg, assistant president of the Distributors Association of San Francisco, gave the following reason for the formation of his employers' association (*10*):

> We want to deal with the unions on a basis of equality, not of submitting to collective force, and our experience in the past has shown us that the individual employer is helpless when opposed by the collective strength of a well-organized union covering the entire industry. This is especially true when that union, as in this case, has interlocking arrangements with other unions. Then it can exert economic pressure which no individual employer can resist.

Whether employer organizations are formed to combat the power of unions, or unions are formed to combat the power of employers and their organizations, is essentially unimportant. The fact that each is trying to fight the other sharpens industrial warfare.

The employer who promotes militant employer associations often insists that a harmony of interests exists in our industrial society. When a group opposes the employers it therefore opposes the interests of society and consequently should be restrained. He believes that he has a right to run his business free from the interference of outsiders.

According to him, union organizers are disrupters of harmony and meddlers in internal affairs.

CONTROVERSIAL LABOR AND MANAGEMENT PRACTICES

To SOME employees and employers, unions have a number of disadvantages. In some cases an entire community may consider that unions are undesirable. To some employers, the practice of "featherbedding"—the union's insistence upon the hiring of more people than are needed to do the job—is wasteful economy. Some employers believe that in many instances unions oppose technological change, and they cite Petrillo as the outstanding example of such tactics.

Some workers maintain that there are disadvantages to unions because their right to bargain as individuals is interfered with, and their hours of work are controlled; but to other workers these disadvantages are advantages. Both employers and employees recognize that unions have increased the standard of living, and many employers are grateful to the unions for their aid in handling difficult personnel and disciplinary problems.

When a clash occurs between a union and management, the community as a whole is often innocently involved. A strike or a slowdown on the New York subways affects millions of workers to a considerable degree, for it interferes with their means of earning a livelihood. However, a strike in a specific manufacturing plant is not likely to have such immediate and disastrous effects on the community.

Some union practices are a cause for concern on the part of serious students of harmonious labor relations, for they do not benefit the labor movement in the least. For example, the union business agent who has acquired dictatorial powers and uses them in an arbitrary and unwise manner brings criticism on the whole labor movement. The "quickie" or unauthorized work stoppage, and the "slowdown," a slightly different variation, are both questionable. Neither is conducive to union-management cooperation and both often do the union more harm than good. Ca'canny, or the restriction of production by the union, is also a questionable practice. Reputable union leaders are not in favor of it and attempt to discourage it. Those who are opposed to unions cite such practices as illustrations of the inability of union leaders to control their members. When picketing is "militant," it often results in bloodshed, injuries, and death, and innocent people are frequently involved.

Questionable labor practices, however, are neither more nor less reprehensible than some management practices. The misapplication of time and motion studies, the degrading treatment of employees, the promotion of waste, the prevalence of the stretch-out, the hiring of private police or thugs, the converting of factories into arsenals, and the arming of vigilantes are a few of the questionable and controversial practices that have sometimes been indulged in by management in the past. It is exceedingly difficult to judge which group has been more guilty of questionable practices. However, as both groups grow more mature and recognize that each has a permanent stake in our culture, such practices should disappear.

As for the leadership of unions, the accusation that many labor leaders are unfit for their positions has been made many times. Without prejudice it can be admitted that there is ample room for improvement. What is more, most of the important men in the labor movement have acknowledged this at one time or another. However, it must be remembered that the type of labor leader that emerges is frequently the result of the attitude of management. When a union must fight for its existence, it is only natural that the pugnacious leader will come forth; but as the union develops and grows, this type of leader will prove to be out of place and will be removed. Cooke, a consulting engineer, and Murray, the labor leader, have collaborated on a worth-while book called *Organized Labor and Production* (*4*) in which they express this view:

> If management has stoutly resisted the collective bargaining efforts of its employees, if it has discriminated against union members, and forced all but the boldest to crouch in the background, then it is likely to be rewarded by a set of officers and a committee noted best for their fighting qualities, and only secondarily for their administrative ability. On the other hand, if management has not opposed organizational activity and thus permitted the calmer and less spectacular leaders to come to the fore, it will be rewarded by a set of officers and committee which have no sores to heal and no background of antagonism to management. Under such conditions the transition for management from arbitrary control and for men from docile submission, to joint responsibility and cooperation will be much easier and with a minimum of misunderstanding and suspicion. Little of permanent value can be accomplished if labor must be constantly on guard against attack.

WARFARE

To UNDERSTAND the basis of industrial conflict, we must recognize the importance of the power drive. Although strikes are attributed to such specific items as wages, hours of work, working conditions, union recognition, or dismissal, we must realize that underlying all of these is a common factor, power and authority—who shall wield it and for what purpose. Everyone agrees that strikes are costly to employer and employee and, in some instances, to the community as a whole. A strike that becomes a knock-down, drag-out dog fight reaches such heights of intensity that not only do both sides suffer financial loss, but the costs are often greater than the amount originally involved.

When industrial conflict breaks out, the employer resorts to costly means of winning. These costs are frequently greater than the cost of settling the strike would be. He often hires inefficient help and strikebreakers merely to show his strength. Similarly, the striking employees will go into debt, eat at soup kitchens, and make other financial sacrifices merely to show their strength.

During a strike, the worker may say he needs more money, and the employer may claim that he should be allowed to run his business as he sees fit. Or the worker may say that he must have the right to work under satisfactory and humane conditions, and the employer may argue that he must run his business with a reasonable profit. Money may be involved, but it may not be. Hence it is incorrect to assume that one or the other side is interested solely in getting more money in the form of profits or wages.

In any form of behavior, the manifestations of conflict are emotional. This applies especially to strikes. Reason, understanding, and intelligence are relegated to the background. Once industrial warfare breaks out, many devious means are used to win it. These types of behavior are basically emotional. The main intent is to win at any cost, and thereby demonstrate which side has the greater power. This applies to employer and employee alike.

Attempts to solve industrial conflicts are usually characterized by the use of force and power. The employer resorts to lockouts, police protection, labor espionage, black lists, and sometimes actual warfare. He also attempts to draw the community into the conflict by means of citizens' committees, loyal employee clubs, and propaganda.

Employee groups use the strike, the picket line, the boycott, and the slow-down, as well as violence and destruction, as their tools in this show of force.

To date, unions have not been adept in using propaganda to gain community support. For example, in a country-wide telephone strike, the company was very careful to inform the public "that *your* telephone company . . ."; in other words, the company tried to convince the public that it was theirs, and that therefore the strike was being waged against the people. The union, on the other hand, did little to convince the people that the inconvenience they were suffering was not the fault of the union.

Some of the more militant labor leaders apparently try to alienate the public even before a strike is called. In New York City, a dispute concerning the management and personnel of the subway immediately affected the public through a slow-down.

With reference to involving the community in a strike, some novel and interesting approaches have recently been used by the labor movement in Japan, which has no traditions to worry about. Some of the so-called strikes which have occurred may be regarded as either annoying or amusing, depending upon the point of view. Sanshi Ishicuka organized a "production control strike" (*Time,* March 24, 1947). Instead of walking off the job, the union members set up a thirty-man committee divided into departments of production, sales, and electric power. Then they stepped up production and used the receipts to pay wages and buy materials. Ishicuka posted notices "To the Management: If you should come to the factory, please keep to the Board Room, and do not come to any factory building." Workers greeted violators in hushed, polite tones: "Will you kindly observe the rules of etiquette and refrain from entering these premises?" Eventually, the union gained everything it asked, and the executives got back a going business that had suffered no losses from stoppages. This strike would, of course, be illegal in the United States, but it makes one wonder about the wisdom of this approach.

According to Mark Starr, who visited Japan at the request of General MacArthur, a streetcar strike was carried on as follows: The employees reported to work and maintained transportation schedules. The only thing they did not do was to collect fares. Instead, they made long speeches to the passengers to the effect that the company was unfair and that they were on strike. Starr says that this strike was settled in short order. A third illustration of the odd pattern of strikes in Japan concerns the telephone operators. They, too, went on strike, but remained at their switchboards. A person who made a call heard a long speech about the company's unfairness, but at the end of this talk the familiar "Number, please?" came over the wire.

Union development in the United States has been accompanied by bloody battles. Street fights, gas attacks, dynamiting, barricades, and other forms of warfare have taken a heavy toll of participants as well as non-participants. Property damage has always run high. The testimony before the National Labor Relations Board and in the earlier congressional committee hearings has been shocking. There must be a better way to solve this conflict. And, if for no other reason than our pride in the thought that we are civilized, an amicable solution must be found.

SOLUTION

IN THE present stage of labor-management relations, collective bargaining seems to offer the best solution. If collective bargaining is to be sincere and mature, both parties must have relatively equal power; neither one must have so much as to force the other into submission. According to Harold J. Ruttenberg (*11*), the purpose of collective bargaining is threefold:

> One: To distribute the fruits of the business enterprise equitably among the employees through their labor organization in the form of increased employment, better working conditions, increased wages, and decreased hours; among the owners of the business, through their management in the conventional forms for rewarding investors; and among consumers, through better quality and lower prices.
>
> Two: To establish mechanisms which give employees through their labor organization the greatest feasible operating participation in the determination of production pro-

cedures and administrative policies, designed to increase the output and distribution of goods and services.

Three: To provide employees and management with peaceful means to work out their mutual problems and changing relations.

In a survey based upon the responses of executives in 181 plants employing over 400,000 workers (*3*), management stated that four out of five labor-management committees have been genuinely successful. Seventy-nine per cent of the respondents believed that the committees were helping to improve employee relations, and 55 per cent believed that production had been increased. A labor-management committee is set up in an attempt to get the two groups to cooperate and thus head off the more formal type of labor-management collaboration in the form of collective bargaining between the union and management, with its constant threat of strike and reprisal. The solution to industrial warfare lies in the cooperation of the two groups and in honest attempts to iron out differences in a peaceful manner. Apparently many matters could be brought under joint control. Wages, hours of work, health, security, seniority, and employee grievances can be settled amicably, provided both groups are willing to meet on an equal basis without either attempting to use force.

Golden and Ruttenberg have formulated thirty-seven conclusions regarding union-management relations. Although collective bargaining would have to be introduced before some of the more controversial of these conclusions would be admitted, this program is nevertheless interesting. It presents in capsule form the thoughts of two men who have had considerable experience in labor-management relations on the side of labor.

SOME CONCLUSIONS REGARDING UNION-MANAGEMENT RELATIONS

1. Workers organize into labor unions not alone for economic motives but also for equally compelling psychological and

social ones, so that they can participate in making the decisions that vitally affect them in their work and community life.

2. Collective bargaining marks the end of individual and the beginning of group relations between workers and management.
3. The initial collective-bargaining practices are influenced in varying degrees by the preunion history of the particular industrial concern and by the fact that genuine union-management relations are initiated by the union.
4. Collective bargaining is an instrument for workers and owners, through unions and management, to solve their problems directly without recourse to the government.
5. Collective bargaining is the extension of the basic principles and practices of democracy into industry.
6. The policies and actions of unions are likely to reflect the policies and actions of management.
7. The attitudes and actions of management largely determine the degree of co-operativeness of union leadership.
8. The time lag in the growth of constructive union leadership, after management ceases its opposition, varies with the extent to which labor assumes responsibility for the development of its leaders.
9. Salesmen and purchasing agents usually possess a more natural ability for handling management's relations with unions than do operating officials.
10. The leadership requirements and responsibilities of management increase under union-management relations.
11. Participation of workers, union representatives, and management at all levels is a prerequisite to the successful administration of a collective-bargaining contract.
12. The peaceful administration of a contract requires the confidence of workers that they will get justice through the collective-bargaining machinery in the settlement of their grievances.
13. Grievances should be settled speedily and as near their point of origin as possible.
14. Grievances should be settled on their merits with no log-rolling permitted.
15. Management should frankly acknowledge the role of the

union in bringing about improvements in working conditions.

16. The successful administration of a contract requires the maintenance of an effective system of communications for both management and the union, in bringing complaints from the bottom up and relaying decisions and policies from the top down.
17. The nature of union-management relations and the administration of a contract are influenced greatly by the pattern of social relationships in any given community.
18. Workers acquire a qualified property interest in their jobs under a collective-bargaining contract.
19. Each group of workers strives for the kind of seniority rules which it thinks will provide the greatest amount of job protection.
20. Seniority is an instrument designed to eliminate favoritism and discrimination.
21. The power to discharge should not be lodged in a single person.
22. Workers should enjoy full freedom of opportunity for advancement and promotion.
23. There is no basic conflict between seniority and productive efficiency.
24. A prime objective of collective bargaining is the redistribution of the proceeds of production.
25. Unions should participate with management in distributing the proceeds of each firm's production between its owners and workers.
26. The proceeds of technological changes, labor-saving machinery, and other factors contributing to lower unit costs of production should be shared equitably between owners and workers.
27. The adjustment of wage-rate inequalities should be exclusively on the basis of the merits of each case.
28. The greater the participation of workers through their unions in setting piecework and tonnage rates, in making time and motion studies, in determining work standards and job evaluations, the greater are the earnings and output.

29. Membership in the union should be a condition of employment.
30. The union shop is a necessary prerequisite for constructive union-management relations.
31. The union shop may be an instrument for either constructive or negative union-management relations, depending chiefly upon management's outlook and the caliber of union leadership.
32. Management's assumption of sole responsibility for productive efficiency actually prevents the attainment of maximum output.
33. The participation of organized workers in management provides an outlook for their creative desires, as it is essentially a creative and co-operative undertaking.
34. Union-management co-operation to reduce costs, eliminate wastes, increase productive efficiency, and improve quality represents a practical program that provides workers with effective direct participation in the creative phases of management.
35. Union-management co-operation tends to make management more efficient and unions more cost-conscious, thereby improving the competitive position of a business enterprise and increasing the earnings of both workers and owners.
36. The natural outgrowth of local-plant and individual-company collective bargaining is bargaining between district or industry-wide organizations of management and unions.
37. The future of industrial democracy depends upon the attainment of full production and employment on a sustained basis during and after the war.[1]

Looking at industrial conflict from an impartial and long-range point of view, we may find that the trials and tribulations of the past two decades or so are a result of the growth of the labor movement, in part supported by federal laws. It would be pleasant to think of this upsurge as merely an adolescent attempt at self-expression. It may well be that this conflict stage has been necessary in the transition from power and force to the democratization of industry.

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[1] From C. S. Golden and H. J. Ruttenberg, *The Dynamics of Industrial Democracy*, copyright, 1942, by Harper & Brothers.

If our political democracy is to survive, we must demonstrate its value in all walks of life. A further introduction of democracy in industry may be achieved when the two groups, labor and management, regard themselves and each other as permanent structures in our society. As they learn to live together and trust each other, bullying, threats, force, and violence will become unnecessary. Mature cooperation will be achieved when they recognize the fact that although each has different psychological, social, and economic reasons for existing, these reasons can be blended together and, in the long run, may not be incompatible.

SUMMARY

INDUSTRIAL conflict is crystallized in the clash of interests and desires of various groups. People in our society are gregarious and willingly form groups for many economic, social, or psychological reasons. Since this is true, it is to be expected that employees will form their own organizations.

The industrial structure of our society is complex, and so there are special reasons for the existence of unions. However, the patterns on which these groups are formed are similar to those which characterize the structure of any group. The use of force and counterforce by opposing groups has led to industrial warfare in which both sides contribute to destruction. The solution to the problem is not the abolition of one group, or one group's rise to power at the expense of the other, but for both in a mature fashion to bargain collectively on matters of joint control. As this takes place, more peaceful means will be found for settling the erstwhile conflicts, and we shall witness the introduction of even greater democracy in our industrial way of life.

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15. Unemployment

IT may appear odd that a chapter on unemployment should be included in a book on industrial psychology. However, unemployment is an industrial phenomenon with psychological aspects. Actually we must recognize that unemployment exists during periods of normal business conditions as well as during recessions or depressions. Some two million people are involved in so-called normal periods, and many times this number in depressions. There are many reasons for unemployment, and it would be presumptuous to assume that a system of industrial psychology could counteract the forces contributing to it. Industrial psychology cannot be considered a cure-all; hence it will be well for the industrial psychologist to examine the effects of unemployment so that he will be able to cope with it when it occurs.

An unemployed person is one who wants to be gainfully employed but is idle because of job shortages. Most of the unemployed meet this definition, but a few people are unemployed because they do not really want to work.

Unemployment has a serious impact on both the individual and society as a whole. An unemployed breadwinner not only is affected himself, but also finds that his unemployment affects his whole family, including, of course, his children. During unemployment serious changes take place in the individual. These include changes in personality structure, attitudes, and various behavior practices. The primary reason for including material on the unemployed in this book is to familiarize people, especially college students, with these changes and with the behavior patterns characteristic of unemployment. The discussion of the various effects of unemployment may enable the reader more readily to understand the abnormal behavior that sometimes is manifest by unemployed people.

If a business recession comparable to that of the 1930's occurs again, young people now in their teens or early twenties may suffer considerably. Comparing the 1940's with the 1930's is like comparing day and night because the major characteristic of the forties has been a labor shortage whereas in the preceding decade it was a job shortage. Salary levels, price structures, money spent for amusements, and the extent of indulgence in luxuries are vastly different. If, in the years immediately ahead, there is to be a regression to the darker days of the 30's, the young people who are now at the age of their maximum energy and aspiration may be in for a rude awakening. Their older brothers and sisters, as well as some of the younger fathers and mothers, may have been "depression babies" and will have experienced the narrowing of needs brought about by the depression. Their caution, insecurity, and unwillingness to gamble on a change of job can be understood in the light of their memory of the preceding decade. The younger groups of today have not had these experiences; if they encounter them without warning, it may be that their maladjustments will be even greater.

This chapter is meant not to strike a note of pessimism but rather to review, in a matter-of-fact way, some of the research resulting from the last depression, insofar as the psychological effects of unemployment are concerned.

THE COURSE OF UNEMPLOYMENT

THERE are individual differences in the effects of unemployment, but it is nevertheless agreed that a general pattern of behavior characterizes most of the unemployed.

One of the factors that governs both the individual differences and the general pattern is the length of the period of unemployment and its meaning to the person involved. Most of the researchers in the field agree that there is a tightening of individual wants and needs during unemployment.

For most people, the course of unemployment runs along the following lines: First, there is a feeling of shock, regardless of how imminent and definite the chance of being laid off appears. Most workers pick up many hints about the possibility of unemployment. They realize that the firm's business condition is such that there must be a reduction of its employees. Even the worker whose job is stable because of either seniority or ability finally comes to the conclusion that it can last at best only another week or possibly a month. Seeing other employees dismissed bolsters this belief. Nevertheless, this period of warning does not eliminate the shock of the "pink slip." In addition to the empty feeling in the pit of the stomach and the questioning of the reasons and the fairness, there is a kaleidoscopic review of the events, and serious doubts as to the wisdom of having taken the job in the first place. When unemployment is not widespread, the first behavior of the individual is to rationalize and decide that it is about time to take the much-needed vacation. This is followed by an appraisal of his abilities and the formation of a plan for an active attack on the hardest job of all, finding a job. At this time he is likely to get in touch with various friends and acquaintances and make it known that he is available if they happen to hear of a good job. But when unemployment is widespread, this "vacation" period is likely to be cut down considerably or eliminated, the job hunt starting immediately.

The second stage is the active search for a job. Most people are likely to begin looking for one that is better than the one they had. Then they look for one similar to it. When unemployment continues, they give up a little more and seek any job in the same industry, with the hope of working into a better job later. If the person still cannot find a job, he will look for any job anywhere. During this period, the individual is rather unresigned. His spirit is unbroken, and although he is unhappy about his predicament he is still hopeful of success.

The next stage in unemployment may be characterized as the breaking-down of the individual. Having failed in his efforts to find a job, he becomes anxious and pessimistic and begins to lose hope. Whereas the unbroken individual will actively look for a job or try to change his social world rather than attribute his unemployment to his own limitations, the broken individual is depressed, indifferent, and even apathetic. He begins to adjust himself to this new, limited, and unpleasant way of life. In this final stage of unemployment he can be regarded as fatalistic or distressed. In either case, he has adapted himself to a life much narrower than his former pattern of living. He becomes a hopeless individual—disorganized and chaotic.

It is impossible to predict how long each of these stages will last in any individual case. They vary in length from individual to individual, depending upon previous background and experience. Each stage lasts longer for a person who has had more success than failure in the past; in fact, he may manage to avoid the second or third stage. However, the person with more failure than success will go through these stages in a relatively short time.

INSTABILITY OF THE UNEMPLOYED

It is generally agreed that the unemployed are more unstable emotionally than people who are employed. However, whether they are that way because of their unemployment, or whether they were emotionally unstable to begin with and this was a contributing factor to unemployment, is much like the "chicken and egg" affair. Data on the unemployed must obviously be based on case histories or observations. Since the experimental method cannot be used, many of the present data and the conclusions drawn are subject to questioning.

The instability of the unemployed seems to have two outstanding characteristics (*3*). One is the loss of a sense of the passage of time, and the other is indulgence in irrational spending. The termination of the daily working routine disrupts the time schedule. When a person is working, he gets up at a certain hour, eats at certain hours, and finishes work at a definite time, all of which establishes his daily activities in a relatively fixed manner. Working often adds meaning to a day. For example, Thursday may be pay day, and Friday is the day before the week-end; Monday starts the work week, and so on. When he is unemployed, the days of the week do not have this meaning. Saturday, Thursday, and Tuesday have merely calendar significance, but little personal meaning. The hour of day has as little personal meaning as the day of the week for the unemployed.

During the early period of unemployment, shame and embarrassment over being unemployed often develop. Because of his own feelings or because of pressure from his family, the unemployed individual sometimes conceals the fact from others. To do this successfully, he leaves at the usual time in the morning and comes home at the usual time at night. This gives him eight or ten hours that must somehow be filled in. Job seeking occupies the first fifteen minutes or possibly the first hour. The balance of the day must be killed in some way. The morning shows at reduced prices in "downtown" motion-picture theaters are a by-product of the depression. Job seekers found it possible to spend three or more hours of their day in this manner. Unemployment is also responsible for the "Society of Sidewalk Superintendents," for huge crowds would gather at places where construction was under way, and would stand and watch the work for hours at a time. Possibly the fact that people derived satisfaction from watching others work is one of the explanations, but there is another explanation—the people just had to pass the time somehow or other.

The second characteristic of the instability of the unemployed is irrational spending. An individual who is looking for a job is often forced to borrow money. When he does he is grateful to his beneficiary and invariably promises to return the money in the shortest possible time. Misunderstandings occur when this money is not returned and the lender believes that the debtor is spending unwisely whatever money he does have. An unemployed man may from time to time obtain a few hours or days of work. When he does so, he is just as likely to go on a brief spending spree as he is to conserve his funds. He reasons somewhat as follows: "Since I've been deprived of so much for so long, indulging in a little luxury is surely justified." Such reasoning is never approved by the person who has loaned the money, and so further misunderstandings occur which intensify the difference between them.

In our society it is polite to offer cigarettes to strangers under many conditions. For example, someone sitting on a park bench might strike up a conversation with the person beside him. When one of them starts to smoke, it is only polite for him to offer a cigarette to the other. However, many people believe that an unemployed individual should not spend his money for cigarettes; he should use it for other needs such as food. They object to a person's asking for a cigarette if he is unemployed. Actually the habit of smoking may be intensified during periods of tension; hence if an individual is more tense while unemployed, we can understand why he should want to smoke more rather than less during this time. The point is that many expenditures of unemployed people are regarded as irrational because of the lowered income. From the point of view of the employed they are irrational, but from the point of view of the unemployed they are not.

The unemployed often indulge in hobbies of a somewhat expensive nature. Raising pigeons, for example, is time-consuming and allows a jobless person to fill in the time. But it does involve some expense, and so the argument between him and the person to whom he owes money continues in unabated fashion.

Another example of irrational spending is seen in the amount of money that unemployed parents with reduced and indefinite incomes spend on their children. Often the money spent for children's celebrations, such as birthdays and religious ceremonies, is out of all proportion to the original need, but this extra spending seems to bolster up the parents and allow them temporarily to regain their status in society, even though the future does not warrant the excessive spending.

INTENSIFICATION OF HABIT

THE general consensus reached in connection with the behavior of the unemployed is that habits are intensified. For example, a person who does little reading when he has a job is likely to read even less when he is out of a job, even though he has more leisure. Similarly, a person who reads considerably when employed will read a great deal more when unemployed.

This also seems to apply to the attitude toward religion. Those who are firm believers when they have a job will probably turn even more to religion during unemployment, and those who are not religious are likely to become even less so during unemployment.

There is no conclusive evidence with reference to changes in moral code during unemployment. Marriages are postponed during depression, but divorce rates are lower than in periods of prosperity.

Apparently women, because of cultural conditions, suffer less than men during unemployment. The average woman regards her work as temporary; most of them resign from their jobs when they marry, or shortly afterward. Since this does not hold for the men in our society because they are expected to support a family, the impact of unemployment on the men must be greater because a permanent job means more to them.

CHILDREN OF THE UNEMPLOYED

One of the most serious consequences of unemployment is its effect on children. Although the children are not themselves unemployed, they suffer deeply when their parents are not working. Unemployment does not affect children as it does adults—there is no loss of the sense of the passage of time and no irrational spending—but in many respects the problems it raises for the children are more complex. The insecurity and anxieties of unemployed parents are likely to be reflected in their children. One such consequence is the lowering of school grades. Many factors contribute to this. The parents' preoccupation with other things often prevents their paying attention to the child's school work. The emotional disturbances in the home are often not understood by the child but nevertheless affect him and his school functions. Truancy and other delinquency problems are greater among unemployed than employed families, and this is reflected in lowered grades. Children are both sensitive and vain at the same time. When they have a new toy, a new book, or a new item of clothing, they are sometimes almost cruel in showing it to the other children. When a child has nothing new to show off, it causes him sorrow and this ultimately is reflected in his behavior.

In one school, for example, replacing worn-out shoes with new ones cut down the truancy rate and increased the grades. The children with worn-out shoes were miserable at having to go to school and looked for excuses not to go because the children with good shoes continually made fun of them. In another community, a principal noticed that some of the children ate lunch even faster than the rapid rate to be expected of children who are anxious to finish eating so they can play. He could not understand this because all the children brought lunch kits to school. However, a secret examination of their lockers showed that most of these particular children carried empty lunch kits. During lunch hour they would wander off for just a few minutes to "eat lunch" and then come back to play. In other words, they were ashamed to admit that there was not enough food for lunch so they got around this by carrying empty lunch kits.

The most serious consequence of unemployment, of course, is not the lowered school grades. Chances are that the lower grades are merely the reflection of decreased efficiency because of poor health. Inadequate diet, lack of medical care, and the disruption of the family are bound to have serious consequences on children.

WORKERS ON RELIEF

GRACE ADAMS has written a book entitled *Workers on Relief* (*1*) that is a tremendously human document on the experiences of the unemployed in their quest for jobs and their final resort to home relief or work relief. She presents a critical review of the W.P.A. and describes the limitations and disadvantages of the program, as well as its advantages and its social implications. The conflicting philosophies regarding the type of work which should be undertaken under the W.P.A. and the various changes in its program are vividly presented, not from the point of view of a historical report, but rather in terms of the impact of such a program on the people involved. The book also contains case histories illustrating the trials and tribulations of people seeking work.

Most of the unemployed preferred not to accept relief because they felt that it was charity and hence degrading. The W.P.A. program which was set up attempted to remove this feeling of accepting charity. The program was sometimes involved in almost vicious lengths of red tape and its purpose was sometimes defeated by chiselers. However, it at least allowed the masses involved to feel that they were working. Although in most cases the lack of meaning in the work was one of its outstanding characteristics, the opportunity of working on the W.P.A. not only provided some money, but enabled many people to avoid the more serious aspects of unemployment. In the future, should unemployment again become rampant, such studies as this by Adams will be valuable in avoiding previous errors.

Many people believe that the best way to deal with the problem of unemployment is through private or local agencies rather than through the federal government. In this group is the W. E. Upjohn Unemployment Trustee Corporation of Kalamazoo, Michigan (*4, 7*). The purpose of this non-profit organization as set forth in its charter is: ". . . for research into the causes and effects of unemployment and to study and investigate the feasibility and methods of insuring against unemployment and devise ways and means of preventing and alleviating the distress and hardship caused by unemployment; to create, experiment with, and put into effect any plan or device that the Board of Trustees may determine feasible to accomplish that purpose" (*7*).

Its approach to the problem of unemployment is on the community level and includes the following activities:

1. To discover and evaluate all the measures which can be taken in a local community.
2. To determine the applicability of such measures in Kalamazoo.
3. To promote the application of these measures.
4. To make available in published form any findings which may be of value to other communities.

There is no need for any controversy as to whether government funds or private funds should be used to attack unemployment and alleviate its impact. If our main concern is the problem itself—as it should be—we can then admit that there are two ways of solving the problem, each of which has advantages and disadvantages.

SUMMARY

DURING unemployment, personality, attitude, and behavior changes occur. Unemployment affects not only the individual but society itself. The family as well as the community suffers as a result of it. The unemployed person is likely to follow a characteristic course of behavior that starts with shock and culminates in distress and breakdown. Loss of a sense of the passage of time and irrational spending characterize the unstability of the unemployed. Habit is likely to be intensified during unemployment; this has been demonstrated in such varied fields as reading and religion. Women are able to stand up under the impact of unemployment more readily than men; this must be understood as a cultural condition rather than a sex characteristic. One of the most tragic aspects of unemployment is its effect on children whose parents are unemployed.

Of the serious reviews of various work relief programs that have been made, one of the better reports is that by Grace Adams which gives considerable insight not only into the W.P.A. but also into the people involved.

Two means of helping to solve the problem of unemployment and alleviate its force are funds of the federal government and private funds at the community level. Both have advantages and disadvantages.

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16. Psychological Testing in Industry

PSYCHOLOGICAL tests present an instance of one of the most common uses of psychological techniques in industry. In fact, industry has more or less accepted psychological testing as the function of the trained psychologist. Whereas many of the other problems such as incentives, training, and accident reduction are studied and attacked by other specialists, testing is most often reserved for the psychologist.

As stated in Chapter 1, tests were used in industry prior to 1910 by Hugo Münsterberg in connection with various problems in his research for the Boston Elevated Railway Company. Since that time, testing in industry has been increasing. During the two World Wars, emphasis was placed on psychological tests and significant contributions were made; work in this field received a tremendous impetus during and immediately following these periods. Before discussing some of the specific programs employed by various companies, we must have a rather complete understanding of the nature of psychological tests, their advantages and disadvantages.

Psychological testing in industry should be approached with caution. Testing is often regarded as a fascinating subject by the novice. In many instances the desire to introduce a testing program is fostered in the hope that a solution will be obtained to a "no solution" problem. Most simply, testing in industry has the greatest opportunity for success when it is used to improve selection techniques. At the present time there are very few psychological test batteries that can be used alone in the selection of employees to the exclusion of the other techniques in the employment screening process. In other words, most tests can be considered only as aids to better selection. Even though tests are used, it is still advisable to conduct an interview, check the application blank information, and use the various other techniques recommended by good personnel procedure.

The natural result of improving the selection of applicants is that labor turnover is decreased, production may be increased, accidents and the probability of accidents reduced, and morale may be increased. However, the mere introduction of a good testing program cannot act like a magic wand to wave all these difficult problems away. Testing is no panacea. If used with moderation, testing in industry can be said to have value. An improvement in job performance of 10 to 20 per cent is often all that can be expected. Although better results are sometimes obtained, this is the exception rather than the rule.

The point to be stressed is that psychological testing in industry is desirable and advantageous but should not be considered as the solution to all problems. For example, some years ago an employer in a certain factory was interested in introducing a testing program and consulted the writer. He complained of his high turnover, long training period, and many other difficult problems. He wanted to introduce a battery of psychological tests so that his selection of employees would be improved, in the hope that this would solve all his problems. A subsequent review of the type of work done in the factory indicated that psychological tests might be of value. In the discussions, it was found that the labor supply was rather limited. A high-school education, either general or academic, was considered a basic requirement for hiring. The question was raised as to why a high-school diploma was necessary, and why graduates of a general rather than a vocational high school were considered desirable. Probing revealed that the policy of the firm was to avoid union organization. In line with this policy, the factory never hired experienced people because they might be union members, and graduates of vocational high schools were not hired because it was believed that they were directly or indirectly connected with the unions. The point of view in this text is neither for nor against unions, and it is not the intention to introduce extraneous material during a presentation of psychological testing. This illustration serves to indicate that this employer wanted to use psychological tests primarily to avoid unionization and secondarily to improve the aptitudes of the applicants. This was called to his attention and he was advised to reconsider his so-called basic qualifications, since there was an available supply of experienced people. But he was adamant; he wanted the battery of tests to select the inexperienced people he considered hiring. The research results did not in any way solve the problem of the union attitude of the potential employee.

In many similar situations, a person does not know what to do either because the problem he faces is too difficult or because there may be more than one correct solution to it. Similar situations arise in connection with hiring practices, and in such cases an employer may grasp at the idea of psychological testing as a drowning man supposedly grasps at a straw. If two applicants are available for a job paying $10,000 a year and both appear to be exceptionally good, the executive officer may prefer to "pass the buck" so that he cannot be blamed if the one employed does not prove to be the success predicted. At such a time he will believe that psychological testing, or even fortunetelling, might be good; for once the decision has been made, it is impossible to know whether the other applicant would have been any better. Hence a psychologist may be called in to give some tests and recommend hiring one of the two applicants. The extent of help a psychologist can give in such a predicament is limited. At best, he can only analyze and interpret the test results of the two candidates and point out any differences the tests reveal. He may not know—and in most instances does not care to guess—whether the tests are related to successful job performance.

GREATEST TESTING DANGER

THE greatest danger in psychological testing at the present time is the possibility of its being oversold. Since the war, many psychological testing organizations have sprung up, and some have made all sorts of claims to potential clients. When these organizations employ professional psychologists, the likelihood of exaggerated claims is not too great; but when they employ people who are immature professionals or pseudo-psychologists, there may be trouble. Psychological testing is a good thing, but like all good things it may be overdone. If unscrupulous individuals who claim to be psychologists or even trained psychologists with advanced degrees fail to use rigidly high standards, the use of testing may be harmful. All claims must be based upon substantial data, and they must be examined. The profession would rather have psychological testing proceed slowly than have it suffer a serious setback because of exaggerated claims or inaccuracy. Precisely because of the rapid increase in the use of tests during the past few years, considerable caution must be exercised.

Before a business concern hires a psychologist or a professional organization to introduce a testing program, it should take the precaution of getting in touch with the American Psychological Association in Washington to determine whether the psychologist or the members of the organization belong to the Association. There are two types of members in the A.P.A.: Associate and Fellow. The

Fellow has had considerably more experience than the Associate, but both have the necessary educational background. There are also various divisions in the A.P.A. The business concern should determine whether the person being considered for the test installation and research is a member of the Industrial Division or the Consulting Division. The fact that he does not belong to either of these two divisions does not make him otherwise less qualified, but his previous experience may not have been too closely related to the business concern's particular problem.

At present, there is an organization which administers a battery of tests to college graduates who expect to enter "a certain business." It does so with the approval of the association formed by the employers in this business. Every candidate pays $15 to take the tests, and the testing organization reports to the business association and recommends whether the candidate be hired or not. Various abilities and aptitudes, including creative ability, are allegedly measured by these tests. Many psychologists who have worked in the testing field readily admit that the successful measurement of creative ability, especially in connection with a specific occupation, is not only difficult but questionable. Such claims should not be made until specific evidence can be offered to substantiate them. In this particular instance, no such evidence has been offered. Applicants for a position in this occupation are forced to pay $15 for tests if they wish to be hired. If it had already been established that the tests could differentiate between successful and unsuccessful candidates, this would not be unfair. But if, on the other hand, experimental research is being carried on, it is unfair to take advantage of the applicants by making them pay for it. Such a testing program is unfortunate. It may well be that this organization will actually develop a way to measure creative ability among other things. At the present time it cannot. It is making claims rather than presenting facts, and it is charging the wrong people for the research. Psychological test selection should depend not upon assumptions but upon the results of research. Candidates for positions should not be made to pay for this research.

A similar situation exists in another professional group, but in this instance the test battery has been administered for years. No one is admitted for training in this profession unless he has passed the battery of tests, and again the applicant pays the fee. No clear-cut conclusions based on the analysis of data assembled over a period of years have ever been presented. It may well be that the test battery actually aids selection. However, in the profession of psychology and specifically in the use of psychological tests, secret formulas and secret techniques are unlikely. People who make such claims are either unprofessional or unethical and should be so considered until they offer evidence that proves their claims.

Some years ago in New York City, finger dexterity testing was the vogue. One of the department stores used such a test to select packers and within a short time many other stores followed suit. These other stores had no data but assumed that the first one knew what it was doing. Actually, this was not the case. The first store based its approval of the testing program on scanty research and an ambiguous report. Finger dexterity tests can be used with some success for certain purposes, but they have no value in the selection of packers (*4*). Blum and Candee obtained correlations of about zero between the test results and the production records of a group of department store packers and wrappers. In a follow-up study, the same authors found that speed and accuracy in clerical detail bore a closer relationship to employee production than finger dexterity (5).

It is necessary to have an understanding of the background of psychological testing before one can be expected to use such tests. Otherwise, he is not in a position to know the difference between a psychological test and a mere series of questions.

CHARACTERISTICS OF PSYCHOLOGICAL TESTS

A PSYCHOLOGICAL test is a sample of an aspect of an individual's behavior, performance, or attitude. It is assumed that the sample measured is sufficient to predict the most usual or typical functioning of the individual. In psychological testing a standardized series of questions or tasks is presented in a standardized manner. Psychological tests must have three attributes: *validity, reliability,* and *norms*. The extent of these three characteristics must be established and known before it can be claimed that the material assumes the proportions of a standardized psychological test. Throwing together a series of questions regardless of whether they concern psychological topics does not elevate them to the level of psychological testing. For example, many newspaper columns and popular books of the parlor-game variety present a series of questions; the person scores the answers and rates himself as "excellent," "good," "bad," or "awful." These are not psychological tests, they are merely batches of questions. Of course, an individual often has an overwhelming curiosity to find out something secretly and so the self-testing plan is very popular. The subjects of the tests usually have wide appeal. For example, a column may ask you to determine whether you are an outstanding husband, and indicate that you can find out by answering a few questions. A person may have inscrutable wisdom, but the only way he can develop a test to measure such qualities is to have a series of questions that have been answered by successful husbands (whoever they are) and unsuccessful husbands.

The most important characteristic of psychological testing is *validity*. Validity means that the test actually measures what it purports to measure. There is only one way to determine the validity of a test and that is to compare the test result with performance on the job. A valid test that measures a specific ability must differentiate between the more able and the less able. If it does not do this, it is invalid and does not measure the ability in question. The same principle applies to any psychological test, and especially to tests used in industry. No one is justified in using a psychological test based upon a priori assumptions. A valid test in industry must differentiate between poor and good workers. Although it is sometimes exceedingly difficult to determine the successful workers on the job and the extent to which they are successful, this difficulty does not excuse avoiding the problem. A psychological test should never be considered in industry unless evidence is presented regarding the extent to which the test is valid. Tests must be developed and used experimentally in order to obtain a measure of their validity, but tests should never be used as a basis for employee selection unless their validity has been established.

The second characteristic of psychological testing is *reliability*. A reliable test yields similar results upon retesting. A test that gives a certain individual a high score at one time and a low score at another cannot be used for predicting usual performance and is therefore unreliable. It must be remembered that a psychological test is a measure of a sample of behavior so that the most typical performance can be predicted.

The reliability of a test is easier to establish than its validity. It may be obtained by giving the same test on two different occasions, by comparing the results with one-half of the test and the results with the other half, or by comparing the results when equivalent forms of the same test are used. The correlation coefficient must be +.90 to establish adequate test reliability.

Since it is much easier to obtain a reliability coefficient than to measure validity, it sometimes happens that the author of a test will report its reliability but fail to mention its validity. A test may be perfectly reliable and still not offer any guarantee or indication as to its validity. Hence one should always be on guard to see that a test has both reliability and validity.

The third characteristic of a psychological test is that *norms* must be available on the test results. A norm is a standard of reference; it enables one to understand the meaning of a test score. Depending on the test, a raw score may be reported in various ways. Total time to complete the test, number of items correct, or number of items attempted are a few of the raw scores obtained on tests. Actually, by itself, the raw score on a psychological test is a meaningless figure. For example, on one test a score of 240 seconds may be poor, whereas on another test a score of 375 seconds may be exceptional. The problem is further complicated when a score of 180 seconds must be compared with a score of 95 items correct. Without the use of a norm, such comparisons would be impossible; at best, they would resemble an attempt to compare apples and peaches.

The two most widely used systems of norms are *percentiles* and *standard scores.* Both measures indirectly give information on the test performance of the individuals in a known population and also show the relative position of one person in the group as a whole. On a test to measure stenographic ability an individual's raw score might be 105 words per minute with one error in transcription. Unless we had information about the range of speed based on many people, we could not know whether this rate of speed was good or poor. However, if this test has been given to 155 gainfully employed stenographers and this individual's score placed her in the 90th percentile, we would be in a position to estimate her ability to take shorthand as "exceptional" because she exceeds 9 out of 10 girls in shorthand speed. If this same individual types at a speed of 45 words per minute and if this score is equivalent to the 20th percentile, we could conclude that 8 out of 10 employed stenographers are faster typists. Actually, shorthand speed and typing speed can be compared. On the basis of the norms available, we can make a direct comparison of this girl's performance on these two tests, and our conclusion, that she is very good in taking dictation but poor in typing, is justified. Whether she is hired depends on the needs of the job; it is most probable that she would have to improve her typing speed before job placement was possible.

For some clerical jobs speed is of great importance, but in others accuracy is more important. For example, for a job of addressing circulars, speed rather than accuracy might be sought. On the other hand, for filing important papers, extreme accuracy would be necessary. Sometimes separate norms on speed and accuracy are necessary, as well as those based upon a combination of the two measures.

In the establishment of norms, specific information should be available, not only about the size of the group measured, but also about such facts as age level, whether the group is gainfully employed, whether it is a college population, or whether it consists of a normal unselected sampling. For example, a person who tests in the 70th percentile of a normal population on an intelligence test can be considered as having above average intelligence. However, his success in a Grade A college or graduate school would be questionable. In other words, a norm is meaningful only when the characteristics of the population upon which it is based are known.

ADVANTAGES OF TESTING IN INDUSTRY

TESTING in industry is a useful aid in modern business and deserves serious consideration, despite its shortcomings. The great advantage in testing is that it can improve the selection process. The problem of hiring inexperienced people often arises. Such employees need many months of training. When the cost of hiring plus the cost of training is considered, these costs often total between three and four hundred dollars per employee, and in many cases even more. If an employer expects to continue in a competitive business, such costs must be curtailed. Psychological testing can reduce the costs of hiring people who will be successful, for its goal is measuring aptitude and predicting ultimate success among inexperienced applicants.

Psychological tests can also be useful in the selection of experienced applicants. In many instances these tests serve as the only good check on the exaggerated claims of an applicant. Some applicants successfully bluff their way through an application blank and an interview, but faking a good test is much more difficult. Many girls who claim to have experience as power machine operators base their claim on non-industrial experience; there is a sewing machine in their home and their mother has taught them to use it. They also claim to know the operations of the machine as well as various types of stitching. An interview cannot check such claims, but a standardized test can establish the accuracy as well as the speed of performance. Further, when norms are available, the individual's ability can be judged more accurately than is possible when judgment is based solely upon an interview.

Psychological testing is also useful in selecting people with promotional ability, discovering reasons for job failure based upon personality traits, and even determining susceptibility to accidents.

MAJOR LIMITATIONS OF TESTING

It is not unusual to find that psychological testing correlates imperfectly with job success. Correlations of the order of +.30 to +.50 are often the best that can be hoped for. From the point of view of the statistician, such correlations are too low for individual prediction purposes. Although this may be true, such a relationship is nevertheless useful, for it helps in predicting success better than if no tests were given. After all, just because we cannot use our arms as wings and fly does not mean that we ought to cut them off.

In the discussion of job satisfaction and morale in Chapters 4 and 5, we said that other factors, in addition to an individual's ability, helped to determine performance. Very often compelling reasons for continuing on a job compensate for an employee's limited ability. On the other hand, for many reasons a person may be a failure on a job, even though he has the ability to be successful. Success or failure on any job depends upon other things besides ability. Most industrial testing programs limit the functions to be measured to mere ability and do not consider the other contributing factors. Furthermore, the claim cannot be made that ability is perfectly measured.

It is no wonder that psychological tests in industry cannot do a perfect job at the present time. Anyone who expects such perfection is unaware of the real situation. For example, a girl who worked in a certain watch factory had an abnormally poor score on a finger and tweezer dexterity test. In this instance better test scores were correlated with better job performance. This girl actually had a poor production record; and since salary was determined on a piece-rate basis, her earnings were very low. She was also rated as a poor worker by her supervisor. Nevertheless, this girl was among the workers who had the longest tenure of employment. An interview with her revealed that she was under extreme financial pressure and simply could not afford to be out of work one day. Moreover, experience had taught her that she did not last at jobs very long, except for her present one, and so she was content to stay on even though the psychological test predicted poor ability and her production records verified the prediction. An opposite example is offered by the man who made an excellent score in a battery of tests for salesmen. He possessed all the traits and abilities considered desirable but had worked out very poorly on the job. An interview revealed that he was married to a very wealthy woman and did not need money; he had taken the job in order to acquire a cloak of respectability. The fact that he did not sell as much as the next fellow was of very little concern to him.

The practical expediency of costs often determines the extent of the test battery. For the average job the cost of testing would be excessive if the test period requires more than twenty or thirty minutes. Since all the aspects of ability cannot be measured in this time, the effectiveness of the test battery is necessarily lowered. Psychological tests are useful but limited in scope. We repeat this over and over, not to defend or attack testing, but to give a clear and honest understanding of the possibilities. Test development is desirable, but care must be exercised that testing does not boomerang.

PEOPLE'S ATTITUDE TOWARD TESTS

It must be remembered that all the people who take tests are human beings and must be considered as such. It is safe to say that the average individual, regardless of his previous success or failure with psychological or school tests, does not relish the idea of being tested. He is likely to be "nervous" and frightened, and to exhibit anxiety and manifest considerable tension. In giving a test to an individual, the objective is to obtain that person's most typical functioning. The above behavior interferes with such functioning. However, the extent of this interference can only be estimated. Chances are that the inexperienced examiner underestimates this interference to the same extent that the subject overestimates it; the happy medium is somewhere in between. The experienced examiner takes pains to develop rapport. He is frank and interested and explains the purpose of the test within the limits of the directions. He attempts to encourage relaxation or at least the absence of tension in the subject.

An individual displays fear of psychological tests for many reasons. He may feel that the test will be unfair and thereby prevent him from getting the job. Also, he may be unable to estimate whether he is doing well or poorly. He often thinks that the test is an imposition to which he should not be subjected since he is applying for only a menial job. He realizes that the test is a challenge, and like most people he prefers not to be challenged in this manner. For all these reasons the attitudes of the person taking the test must be taken into consideration.

The employer who sponsors a testing program has still another point of view. Frequently his motives are not altruistic but are concerned with dollars and cents. For him the real question is how many dollars will be saved as a result of the test program. Naturally, the cost of the testing program can be determined, but few psychologists, regardless of their experience, are able to estimate with anything resembling reasonable accuracy the savings which may accrue. A safe prediction might be that the use of tests may result in a production improvement of 10 per cent. To make a reasonably accurate estimate, the psychologist would have to know the cost of the training program per individual, the profits before and after the introduction of the program, and other related figures. Most employers do not give this information to strangers, even psychologists.

Some employers are willing to introduce a testing program and pay the psychologist a fee based upon a certain percentage of the money saved. The ethics of such a proposal are questionable, but it can certainly be said that such an arrangement is unfair to the psychologist and should be avoided. After all, a surgeon is paid regardless of whether the patient lives or dies; in fact, he is usually paid in advance. Also, as we said earlier, an employer often grasps at psychological tests as a last straw to help him with a problem that psychological testing really cannot solve. Unless he is acquainted with the possibilities of the tests and warned that the chances of success are not certain, he may become annoyed, dissatisfied, and even anti-psychological testing.

A third group of people whose attitudes toward psychological tests should be mentioned are union officials and members. It is safe to say that, up to the present time, no union has been very sympathetic to psychological testing programs. Part of this reaction can be accounted for by the unions' mistrust of "scientific" management, for they erroneously consider psychological testing as a phase of "scientific" management. Business organizations which have union contracts are likely to encounter difficulty in introducing a test battery as a means of selecting employees. Correctly or incorrectly, the union figures that this is an attempt to hedge on the various clauses in its contract that deal with the closed shop or general hiring practices. Many union executives believe that psychological testing serves only the interests of the employer; the fact that it advances the interests of the employee is open to debate. The unions' general disapproval of psychological testing programs must be reckoned with in a unionized industry.

INTRODUCING A TESTING PROGRAM

THE introduction of a testing program in a business organization demands that a research program accompany it. Attempts to select applicants with the aid of psychological tests based upon opinion and judgment rather than statistical facts are rarely if ever justified.

Before introducing a test battery it is extremely advisable to consult an industrial psychologist. He not only has training and background in tests, but has had experience with different testing programs. He knows that there is no short cut in the process, and that a testing program must be accompanied by research. There is a practical reason for research to parallel a testing program. A decision must be made as to which applicants will be recommended for hiring and which will be turned down. It is not at all safe to assume that the best applicant—that is, the one with the highest score—will be the best person for the job. For example, it has been unequivocally determined that in many occupations the people with the highest scores on an intelligence test are not necessarily the most successful employees. It has been established that in many jobs scores above a certain point are conducive to inefficiency and high turnover. In these occupations, the best employee, from the point of view of a prediction based upon an intelligence test score, is the one who ranks in the middle range. It is often necessary to establish a maximum score on a test, above which it is unsafe to hire; a minimum score must also be established, below which it is unsafe to hire. In other words, test results must be compared with success on the job, and a minimum critical score, and sometimes a maximum critical score, be established for hiring purposes.

Another reason for employing the services of a psychologist is that some tests have misleading names; they can be used for selecting workers in occupations other than that implied by the name of the test. For example, the Minnesota Clerical Test is a name-checking and number-checking test, but it has been found useful in the selection of department store packers and also inspectors. In both these instances, the usefulness of this test was greater than when it was used to select clerical workers.

It cannot be expected that a battery of psychological tests which have been used successfully in one company will give the same degree of success in another. The type of personnel in two neighboring plants manufacturing the same type of product may vary tremendously. Such factors as working conditions, morale, and selection may, if known, predispose the better applicants to seek jobs in one plant rather than the other. Moreover, age, sex, and religion as a basis of selection are often artificial factors and may vitiate the validity of the testing program.

Because of relatively recent school experience, young people are often more familiar with pencil and paper tests and as a result do better on them. Older people may be frightened at the very thought of writing, as a result not only of passive decay but also of certain unpleasant memories connected with school tests. If factory A hires young people and gives a pencil and paper test, such a test may work for that factory. Factory B may be just as successful from the point of view of production but may hire older people who are equally efficient. This factory will most likely not be able to use the pencil and paper test which was successful in factory A. The principle that test batteries should not be borrowed is important. Naturally, this does not mean that one should not attempt to benefit from the experiences of others, for such information may provide useful leads.

The only justification for using psychological tests for selection purposes is based upon the assumption that the test results have a statistical relationship, known as correlation, with success on the job. This must be established before it is either safe or advisable to hire on the basis of psychological testing.

Tests should be used in industry only when the test results are known to be related to job success. At this point it is necessary to ask what job success is. This is not a simple question; on the contrary, it is very complicated. Serious thought on this will bring out many difficult angles. The performance of any job, no matter how simple, can be measured in a number of different ways. For example, total production may be a measure of success on the job; hence the more an employee produces the greater his success. On the other hand, total production may need qualification because spoilage may enter the picture. In other words, a second criterion of success on the job is accuracy of production. If these two factors are perfectly correlated, there is no problem. But they never are, and so both must be considered as criteria of success. The problem is further complicated by the fact that there are additional criteria of success. For instance, ratings of supervisors measure an aspect of a worker's efficiency. These ratings are related to the previously mentioned factors to some extent, but the relationship is small enough to demand that the ratings be considered a separate factor. After a certain period of employment, the worker may be considered as having paid for the cost of his training, and so from the employer's view the employee is thought successful when this period has been passed. Hence length of employment is also a criterion of success.

In certain jobs earnings are determined on a piece-rate basis, and earnings and production records may be perfectly correlated. However, since few claim that the piece rate in one department of a factory is exactly equal to the piece rate in another department, earning capacities may vary. Therefore, similar earnings may not represent similar production ability.

Some jobs have criteria of success peculiar to the job. In selling on a commission basis, the more the salesman earns the better he is assumed to be; hence actual earnings can be considered as still another criterion of success. Ability to advance beyond the original job is sometimes taken as another criterion of success.

In any organization contemplating the use of psychological tests, job success must be clearly defined. In some instances, one criterion may be considered to the exclusion of all the others. From the point of view of correctness and accuracy it is best to combine all the available criteria into a single measure. Statistical techniques have been devised for this purpose. It must be remembered that hiring based on tests can be effective only when there is a basis for comparing the test scores with the criteria of job success.

STEPS IN THE DEVELOPMENT OF A PSYCHOLOGICAL TEST

It is highly unlikely that any single psychological test will be 100 per cent effective in the selection of employees, because no job ever depends upon any single ability or aptitude. If the major component of a minute assembly job were finger dexterity, it would nevertheless be necessary to recognize that other minor components, such as eye-hand coordination, strength of grip, intelligence, interest, and adjustment to the job situation, should also be considered. In this case, the finger dexterity test would be useful to diagnose ability in that part of the job calling for finger dexterity, but it cannot predict concerning the other components of the job. This being the case, it is always advisable to have a test battery which consists of either a single test made up of a number of subtests, or several different tests.

A psychological test must be standardized and for industrial purposes a minimum of seven steps must be taken. *Step 1* is a complete analysis of the job. In an earlier chapter the uses and importance of job analysis were discussed and the methods for conducting such an analysis were described. From the point of view of psychological test development, an understanding of the duties and requirements of a job as determined by a job analysis is essential. Before the abilities required for the successful performance of a job can be measured, it is necessary to analyze the job to determine these abilities. For instance, there is much more to selling drugs wholesale than is at first apparent. A job analysis reveals that such a salesman has many duties. He advises the drugstore owner on merchandising and displays, and recommends inventory systems. At times his ability to sell his products is based to some extent on his knowledge of the pharmacist's stock. He advises the pharmacist on the development and uses of new products. He must be a good listener, especially when the pharmacist wants to gripe to someone. Of course he must also be able to write orders. Large wholesale drug companies have different lines and the commissions paid often vary according to the line being sold. These factors and many others are uncovered in a job analysis. Since no job is ever as simple as it looks, a job analysis is a prerequisite to the other steps in a development of a test.

Step 2 is the preliminary selection of a battery of tests. As soon as leads are available from the job analysis, the psychologist decides on the battery of tests which he believes will best measure the various—or at least the major—components of the job. If no tests are available, he may have to develop a series of questions or a performance task which he believes is heavily weighted in the job components which are necessary for prediction. For example, most of the available psychological tests cannot actually measure success in operating a power machine. Here it might be best to use a job sample for testing. In a study on the selection of sewing machine operators Blum (*3*) devised a zigzag pattern which the subjects were required to follow, using an actual machine with a needle but no thread. They were also required to sew a zigzag pattern in between two lines.

Before this job sample could be claimed to be a valid test for selection, it was necessary to test the test. In this particular study it was found that this sewing task was moderately helpful in selecting experienced operators but was practically useless in selecting inexperienced operators, i.e., in predicting who would become good operators. Testing the test is the crux of the entire problem of industrial testing. A test should never be used unless it has been tested in the specific situation. Therefore, the choice of a preliminary group of tests in step 2 is primarily a matter of

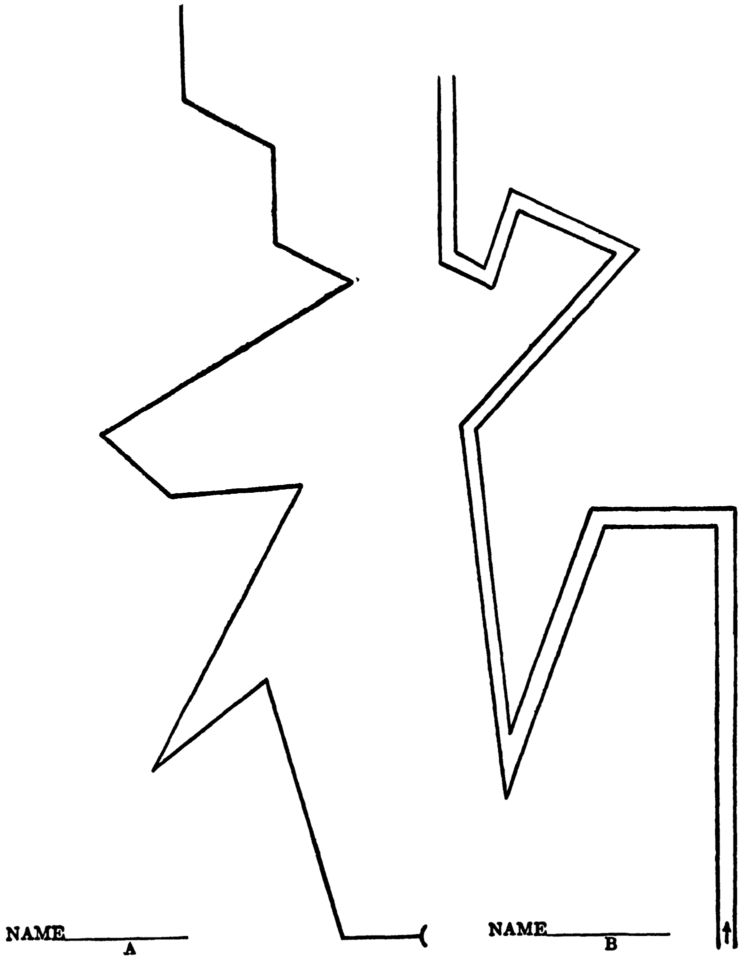

Fig. 34. Blum Sewing Machine Test. (From M. Blum, *3*.)

judgment. The psychologist uses his best judgment, but it cannot be accepted as valid.

In *step 3,* the psychologist administers the preliminary battery of tests to a group of individuals whose degree of job success can be determined. The number of people to be tested is often determined by the expediencies of the situation. Naturally, the larger the number the better, but sometimes no more than twenty subjects are available in the organization. At this point costs must also be considered. A safe practice from the point of view of economy is to conduct a pilot study. A pilot study is a full dress rehearsal on a small scale. It enables the psychologist to predict the chances of success if he were to start testing very large groups. It is also useful because it serves as a check in the last step to be described.

Step 4 involves determining the actual abilities of the people being tested. This means measuring job performance according to the criteria of success available. Although this step does not involve psychological tests it is an important and essential part of test standardization and must be carefully worked out. Most psychologists working in industry judge the value of a testing program on its relation to the criteria. One psychologist, Drake, considers this step unnecessary; he believes that the worker's performance on the test should be regarded as the criterion itself, and that work performance in turn should be evaluated against test performance. This view, according to the present author, is either a little ahead of the times, because psychological tests are not that good, or an attempt to evade the difficulty of determining job criteria.

In *step* 5 the subjects' scores on the tests are compared with a measure of their abilities. This step requires a careful examination not only of the total score on the test but of the scores on the various subtests, as well as the answers to the various items. If some of the test items or the total score differentiates with statistical significance between the good and the poor employees, the test can be considered to have value. If there is no statistically significant difference between the results of the tests on the two groups, the tests cannot be considered as having value and must be rejected.

It should be noted that when employees are tested the poor ones are not likely to be substandard, but marginal or mediocre. After all, the really inferior employees either leave or are fired. Testing applicants who have been hired, regardless of their test score, during the experimental stages of developing the test battery sometimes produces a group of poor employees. The fact that very poor employees, at least from the point of view of actual ability, are hardly ever found on the job makes the testing problem difficult.

Step 6 requires the examination of the accepted tests or test items. Here extended statistical analysis is necessary. For example, some of the items on the test may discriminate much more keenly between the two groups than other items. Naturally, such items should be given greater mathematical weight. The exact mathematical weight should not be an arbitrarily assigned number such as 1, 2, or 3 but should be determined with statistical accuracy.

The *final step* in developing a test or test battery is its administration to a new and preferably larger group. This step should never be overlooked because it provides a very important check. In addition, this step is necessary to establish the reliability and validity of the test battery, and also the norms. Many attempts have been made to develop a battery of tests to select salesmen. In some instances the preliminary battery has shown considerable promise. However, when the test has been administered to another group, the promise has often evaporated into thin air. This means either that the statistical findings for the original sample were not statistically reliable or that the original sample was unique and not representative.

Only when the procedure described in all these steps has been carefully followed, can a particular industrial organization be in a position to know the value of the testing program it has introduced.

All this should not be regarded as extreme negativism; it is not intended to discourage the use of psychological testing in industry. On the contrary, provided that too much is not expected of it, testing can be extremely useful in industry. Its real value and extended use in the future will depend upon rigid discipline and caution being exercised in its use at present. The prognosis for the development and use of testing is good provided it does not get too many black eyes and bruises in its current stage of development.

A final consideration, once a test battery has been developed, is the relation between the critical score and the availability of the labor supply. In the study on the selection of sewing machine operators, previously referred to, the relation between the critical score and the percentage of the good and poor groups eliminated was established. Table 36, which presents this relation, shows that with a critical score of 260 seconds or over, one out of every five employees in the poor group would have been eliminated and all those in the good group would have been included. This is far from adequate because 80 per cent of the poor employees would have passed this testing screen. On the other hand, if 200 or more seconds is the critical score, seven out of every ten poor employees would have been eliminated, but three out of every ten good employees would also have been excluded. If the labor supply is

TABLE 36. Critical Score and Percentage of Groups Eliminated

Critical Score	% of Poor Group Eliminated	% of Good Group Eliminated
260+	20%	0%
240+	28%	4%
220+	56%	20%
200+	72%	28%

limited it is sometimes impossible to eliminate three out of every ten potentially good employees; hence a compromise must be reached. In this particular study it was recommended that the critical score of 200 seconds be used; but when the labor market is very tight the score would have to be lowered.

In addition to the fact that the introduction of testing in industry demands research and that tests cannot be passed on as a unit from one organization to the next, the previous uses of the test in question must also be considered. For example, there is a test on the market called the "two hand coordination test," but careful check of the literature reveals no references to this test. To quote private correspondence with the author: "All that we have on the test so far are percentiles. Administration has not been sufficiently standardized so that we get high reliability from one situation to another. Several validity studies have looked promising but we also get such high correlation between this test and our hand dexterity test that I am coming to believe that the simple hand dexterity test is sufficient in most situations." A brochure describing the test claims that it provides a "sharp instrument" for eliminating unfit candidates. A test that is relatively unreliable and has questionable validity does not meet the standards of psychological testing. This test is certainly not the "sharp" instrument that it is claimed to be. A psychologist would not fall for such claims. He investigates facts, not opinions and claims, in considering a test for selecting employees.

Another example is an advertisement in a trade journal which claims that a certain peg board measures the dexterity required for successful performance on the job. The relationship between a job analysis and the abilities or aptitude measured by this so-called test is extremely remote, if not nonexistent. For all practical purposes the test consists merely of a piece of wood painted in different colors, and a series of large pegs which are to be put in the various holes that have been made in the wood. If any research of the type described in this chapter was ever conducted prior to the sale of this test, the writer will be willing to eat the pegs and the board.

RANGE OF TESTING

THERE are literally hundreds and hundreds of psychological tests for measuring a wide range of abilities, aptitudes, personality traits, interests, and attitudes. The tests differ in accordance with whether they are individual or group tests. An individual test is given to one person at a time; the examiner must be experienced. A group test can be given to groups of people at the same time. However, no hard and fast rules differentiate individual and group tests. With slight modifications some individual tests can be given to small groups at one time, and by the same token a group test can be given to one individual.

Psychological tests also differ according to whether they are performance tests of a manipulative variety, or pencil and paper tests of the verbal variety. But even this is not a clear-cut distinction because some performance tests are given by means of pencil and paper tests. MacQuarrie's mechanical ability test is a pencil and paper test which measures performance.

For the practical purposes of industry, psychological tests can be grouped into four categories: intelligence, personality, achievement, and aptitude.

The intelligence tests used in industry are of the pencil and paper variety and are short. One such test widely used in industry is the Otis Mental Ability Test. It consists of 75 items and includes questions on arithmetic, vocabulary, the following of directions, and general information. A modification of this test has been devised by Wonderlic (*9*) and the time limit has been reduced to twelve minutes. If one wants a crude estimate of intelligence and is willing to interpret the results loosely, either of these tests is useful. But if accuracy of interpretation is required, especially when employees are to be selected who will need to undergo an intensive training period of a year or more, it is advisable to use an individual test such as the Wechsler-Bellevue or one of the longer pencil and paper tests.

Personality testing in industry is far behind intelligence testing. The personality tests are often of the inventory type. A series of questions is asked and the subject is encouraged to answer them candidly and truthfully with a "yes" or "no." The nature of the questions depends on whether introversion, neurotic tendency, or another of the so-called "personality traits" is being measured. Typical test items are:

> Do you worry over possible misfortunes?
> Does discipline make you discontented?
> At a reception or tea do you feel reluctant to meet the most important person present?
> I seldom worry about my health.
> Look for sympathy?
> Mind wanders easily?

The major limitation of such tests for selection purposes is obvious; the applicant's answers may indicate not what he really thinks, but what he believes he should answer in order to get the job.

A more meaningful approach to the measurement and understanding of personality is afforded by tests using the projective techniques. These techniques present a relatively free situation to the individual and the exact answer is determined by what he projects into the situation. For example, the Rorschach test presents a series of ten standardized ink blots to the subject. In each instance the subject states freely what he sees, either in part of each blot or in the complete blot. The examiner, who must be trained in this technique, analyzes the results in numerous ways. The scoring is based on the type of response—

whether the subject reports movement of human figures, animate or inanimate objects, etc. The rigid supporters of this technique exhibit an almost religious fervor in their claims. The test does have diagnostic value in analyzing personality and emotional aspects of the individual, and even the intellectual level can be estimated.

Another test of this variety is Murray's Thematic Apperception Test, in which a series of pictures are presented to the subject; he is asked to tell an extemporaneous story about each picture. Analysis of the stories, especially when the same themes are repeated, reveals his dominant drives, as well as his conflicts and inhibitions.

Balinsky (*1*) administered the Rorschach to the two final applicants for a job as plant superintendent of a machine shop. Both men fulfilled all the technical requirements, but the personnel director wanted to make certain that the personality of the man selected would be suited to the social atmosphere in the shop. The responses to the test were interpreted in terms of the following eight points:

1. Basic attitude.
2. Drive.
3. Relation to authority.
4. Relation to subordinates.
5. Performance level.
6. Responsibility.
7. Persistence.
8. Initiative.

The relation between Mr. Z's Rorschach and the personnel director's impressions after Mr. Z. had been employed eight months was as follows:

Rorschach	Personnel Director
Basic Attitude:	
Moderately self-assertive, especially in new situation. Will probably try to be more self-assertive by a conscious effort.	Moderately self-assertive.

Drive:	
Tendency toward strong drive and push which seems commensurate with his ability. Will probably be able to get things done quietly and without fuss.	Got things done without fussing. Showed a strong drive.
Relation to Authority or Superiors:	
Will be very cooperative but will not be uncritical.	Cooperative with management and offered feasible suggestions.
Relation to Subordinates:	
Seems to be sympathetic toward people and aware of their differences and difficulties. Will probably get good cooperation from men. Is himself very critical and shows signs of stubbornness occasionally.	Well liked by men in shop and they trusted him.
Performance Level:	
Generally even and high grade. Is methodical and cautious in approach.	Quality of work was good and he was meticulous about what he did.
Responsibility:	
Has high sense of responsibility. Does not shirk from a task.	Accepted responsibility early.
Persistence:	
High degree of persistence and used imagination when in difficult situation, not giving up or finding an unrealistic and impractical way out.	Very persistent until he finds a solution.
Initiative:	
Has initiative, but may need encouragement to put it into action. When he is more used to the situation and feels more secure, he will probably show more initiative.	Showed initiative almost immediately by ironing out certain production difficulties which he found existed.

The personnel director was very well satisfied with the selection of Mr. Z.

There is no doubt that the personality test is important and useful in industry. Use of the projective techniques is limited, because the examiner must have considerable training and the tests are time-consuming from the point of both administering and scoring. For most jobs selection by such tests would be prohibited by the costs. However, industry should whenever possible overlook these disadvantages, for this type of test is likely to be useful in selecting people for important jobs. Despite their limited industrial use up to the present, these tests show much more promise than the pencil and paper inventory variety.

Achievement testing in industry is often called trade testing. It is very useful, especially when an interview cannot establish the degree of ability. A trade test deals with a specific task and has been standardized so that the reliability and validity of the test are known and norms are available to enable an evaluation of the candidate. In the selection of butchers, plumbers, stenographers, and typists, a trade test can be worth a thousand-word interview.

Aptitude testing in industry is important when inexperienced people are to be selected. The theory underlying aptitude tests is that they measure a present ability which is related to the required future ability. Future ability is not measured, for that is not within the realm of psychological testing and should be relegated to the quackery basket along with fortune-telling, etc. For example, finger dexterity measures the ability to use the fingers and manipulate minute parts. A finger dexterity test is not necessarily an assembly test, but it can be considered an aptitude test for watch factory assembly because the subject's finger dexterity ability at the time he is tested can be correlated with the ability he must have in the future for watch factory assembly. Caution is necessary in aptitude testing, for the test must be ultimately related to the job. In actual practice, aptitude testing fills a greater need in vocational guidance work. The only instance when it is justified in industry is when inexperienced workers are to be hired and trained.

PROBLEMS OF ADMINISTERING TESTS IN INDUSTRY

A VERY important reason why a psychologist experienced in psychological testing should be employed for a test program in industry lies in the nature of the problems that arise in giving tests. Applicants or employees who take tests are likely to be cautious. They need encouragement in order to give their most typical performance, and they must be given honorable guarantees. Regardless of their success on the job, employees worry about the test, for they feel that poor test performance may cost them their job. If the precaution of dispelling such ideas is not taken, they are likely to show antagonism and resentment, and the employer will have a serious problem of morale on his hands. Much of their anxiety can be relieved by statements to the effect that the testing program to be used in the company in the future will depend upon whether the established employees do well on the tests, and that if the employees do not do well on them it will mean that the tests are unsuitable for the company. It is also desirable, when possible, not to give the employer the exact test results in any individual case; this knowledge gives the employees further reassurance.

The attitude of the examiner while administering the tests is important. He must be friendly and show a personal interest in the subjects, but still maintain the standardized conditions for the test. He must know how to cope with unanticipated responses during the testing—laughing fits, talking, and even cursing. Ability to handle these so that they cause a minimum of interference is a prerequisite of an experienced examiner. The person administering the test program not only should be trained in psychological testing techniques but should spend an apprentice period with an experienced examiner. This is true regardless of whether he has a master's degree in psychology or not. Some years ago the author hired an outstanding graduate student who had his master's degree to administer an industrial testing program. The student phoned him that the tests could not be given because of a broken stop watch. The author's hurried taxi ride with a spare stop watch proved to be unnecessary, for the student's watch merely needed winding. In his many courses, the young man had never been taught to wind a stop watch.

SUMMARY

THE psychologist's accepted role in industry is the administering of psychological tests. Within limits, testing can be useful as an aid in the selection process, but it should not be regarded as a panacea; its greatest danger is in being oversold. A psychological test is a sample of behavior which predicts the most typical functioning of that behavior. The three characteristics essential to psychological tests are validity, reliability, and norms.

The introduction of testing in industry requires that research run parallel with the test. Care should be exercised that psychological tests are developed in a standardized fashion. Test batteries cannot be handed from one organization to the next, because they often are valid in one company but not in another. The range of psychological tests is wide and includes many tests of intelligence, personality, achievement, and aptitudes. In psychological testing the attitudes of the applicant, the employee, the employer, the union, and the psychologist must be considered if the testing program is to have a fair chance of success. Psychological tests are helpful in selection, provided not too much is expected of them.

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17. Psychological Testing Programs Used in Industry

THE development and use of tests in industry are widespread at the present time, and they promise to be continued on an increasingly broad and varied scale. This chapter will deal with the scope of the tests actually used by various industrial and business organizations and will present intensive reviews of several of these testing programs.

A selected and annotated bibliography on employment tests used in industry and business was compiled in 1945 by the Industrial Relations Section of the Department of Economics and Social Institutions at Princeton University (*3*), under the direction of J. Douglas Brown. Approximately 350 references are included, and good judgment has been exercised in the selection of the material. Since it presents a brief survey of the various kinds of tests which have been used in this field, it should be very useful for the student of psychological industrial tests.

Oscar K. Buros, affiliated with Rutgers University, has edited a series of *Mental Measurements Yearbooks* (*4*) and is steadily engaged in keeping the material in this field up to date. These Yearbooks are a much more comprehensive and complete source because they embody a critical survey and are not limited to industrial tests but include practically all the work which has been done in the entire testing field. A group of contributors carefully selected by Buros reviews all the available material on practically all the psychological tests.

The work of Brown and Buros forms a sound base for the dissemination of information on test standardization and on psychological test use and research.

COMPANIES USING PSYCHOLOGICAL TESTS

To LIST all the companies in the United States that use psychological tests would be a lengthy and impossible task, impossible because test results are often described without mention of the specific companies involved. Moreover, the companies that pay for research sometimes regard the material as "top secret" or as their private property, and so their policy is to discourage reports in the literature. Such a policy often gives a company an advantage over its competitors and from this point of view the policy is wise, but it constitutes an obstacle in the development and use of tests. An incomplete list of the companies which have used psychological testing can be made, however, and in some respects may be said to comprise an industrial "Who's Who." A random list of some of the companies and the tests they use is as follows:

The Johnson & Johnson Co., well-known manufacturers of surgical bandages, have used tests to select foremen and clerical workers. The Vega Airplane Co. and the Curtiss Wright Corp. use tests in their selection process. R. G. Le Tourneau, Inc., has developed a battery of tests to measure the primary mental abilities needed for job success with them. The Sun Oil Co. has been interested in developing a battery which would be suitable for selecting people who could be trained to operate machine tools. The Lockheed Aircraft Corp. has had successful experience with personality, intelligence, and mechanical aptitude tests in the selection of many different types of employees. The Hawaiian Sugar Refining Corp. has found the use of tests for the promotion of employees successful. Aptitude tests as well as intelligence tests have been used by the A. C. Spark Plug Division of General Motors, the Woodward Governor Co., and Martin and Schwartz, Inc. The Harwood Manufacturing Co. and the Kaiser Glove Co. are two firms in the needle trades which have hired operators with the aid of tests. The American Aluminum Co. selected a group of prospective foremen for training on the basis of psychological test scores. Apprentice tool makers are hired by the Scovill Mfg. Co. with the aid of tests. The Milwaukee Electric Railway and Light Co. uses a battery of many tests to select a category of employees known as "electrical trouble men." The Philadelphia Electric Co. has found tests helpful in the selection of substation operators. Westinghouse Electric Co. uses tests as part of its promotion program for clerical workers. The Atlantic Refining Co. selects men for responsible positions, such as accountants and statisticians, with the aid of tests. Most of the insurance companies—among them the Liberty National Life Insurance Co., the Aetna Life Insurance Company, and the Metropolitan Life Insurance Company —have found test batteries helpful in selecting agents.

The Harris Trust and Savings Bank of Chicago uses both personality and intelligence tests in its selection process. Considerable research has been done by the Kimberly-Clark Corp.; this concern has developed its own tests, such as the Kimberly-Clark packing and inspection test, which have been made available to the profession.

W. T. Grant hires clerical workers on the basis of tests. The Tremco Mfg. Co. has done much research on the selection of salesmen. R. H. Macy has used psychological tests for years in hiring employees for many of its departments. Procter and Gamble has found tests useful in selecting salesmen and sales managers. Aptitude tests have proved valuable to the Todd Company in hiring salesmen.

This list has not been organized on the basis of either the type of company or the type of test problem because it was believed that a random order would best illustrate the wide and varied use of the tests.

SPECIFIC INDUSTRIAL TEST USAGE AND RESEARCH

A FEW of the many studies which have been conducted will be reported rather completely to illustrate the systematic discipline required in the use of tests for industrial purposes. None of these studies are to be regarded as illustrating an ideal testing situation; they were made in the best way possible in view of the limitations imposed by the particular industrial situation.

A study on the use of dexterity tests to select watch factory workers was conducted by Blum (*1*). The first step in the research called for job analysis of the different types of work performed in the factory. This brought to light the following important job requirements: fine finger movements, the manipulation of tweezers, and the ability to continue doing delicate and sometimes intricate tasks over long periods of time without any increase in tension or maladjustment.

A review of the available test material indicated that, in view of the factory's requirement of a brief testing period, the Johnson O'Connor finger dexterity and tweezer dexterity test would probably be best. Prior to embarking on the testing program, however, the various available criteria of success were surveyed, and three measures were obtained: length of employment, salary ratio, and foremen's ratings.

The length of employment criterion was divided into four categories. The first was the "less than one week" group. The majority of employees in this category left or were dismissed within one week because of poor ability for the job. From the point of view of this criterion, this group was the poorest. The second category was the "one week to four months" group. Management believed that the job could be learned adequately within four months. Those who could not learn it in this time either were dismissed or resigned. From management's point of view, such an employee was inefficient; according to the employee, he could not earn enough. In any event, the employment relation was severed. The third category was the "four months to one year" group. These employees were regarded by management as moderately successful. The fourth category was the "one year or longer group." These employees were considered to be most successful; the training costs for them were lowest and the group had the highest production.

The second criterion was salary ratio. Since all employees were on a piece-rate system, earnings were a direct reflection of production. The figure used was the average of the weekly earnings over a three-month period. This time was considered long enough to average out minor peaks or slacks in business and minor difficulties in production. The actual criterion was expressed in the form of an index, with $20 earnings per week equal to a base of 100.

The third criterion was the rating of employees by the foremen. Each foreman was asked to give an over-all rating on the basis of his opinion of the employee's usefulness and efficiency. In accordance with this rating, each employee was classified as excellent, good, average, poor, or unsatisfactory.

Five measures of test performance were established. Two were based upon speed, the total time required to do each test.

Another measure was the rating of the subject's qualitative performance on each test. Since this adds meaning to any objective score such as total time or items completed, it will be described in detail in the hope of encouraging the use of such a measuring technique. The qualitative rating is the examiner's over-all estimate of the test performance. It includes how well the subject follows directions, tension during the test, and the method used in doing it. The following scale was used:

Rating Scale for Quality of Performance

	Good	Average	Poor
Accuracy of selection			
Grasp of pins			
Positioning of pins			
Placing of pins			
Hand tremor			
Condition of board			
Pace			
Position and movements of arm			
Body posture			

The fact that there is an appreciable distribution in qualitative performance ratings is illustrated by the findings in this particular study; they are presented in Table 37.

TABLE 37. Distribution of Quality Ratings on Finger and Tweezer Dexterity Tests

Quality Ratings	Finger Dexterity Test		Tweezer Dexterity Test	
	Employees in Watch Factory	Applicants for Factory Jobs	Employees in Watch Factory	Applicants for Factory Jobs
Total number of individuals	163	420	143	420
1.—Excellent	5.0%	3.6%	13.3%	5.9%
2.—Good	44.1%	39.2%	55.9%	50.1%
3.—Average	48.5%	50.9%	28.0%	36.3%
4.—Poor	2.4%	5.8%	2.8%	7.1%
5.—Unsatisfactory	0.0%	0.2%	0.0%	0.5%

This measure of test performance results in an over-all rating by the examiner of the subject's manner during the test. Most performance tests and many pencil and paper tests readily lend themselves to such a rating. These ratings are useful in considering a person for hiring.

The fifth measure was a comparison of the time taken to do the second half of the finger dexterity test and the time taken on the first half. It was assumed that the difference between the total time on each half might measure ability to improve the rate of speed and might therefore be useful as an indicator of rate of improvement on the job.

In this study, 258 subjects were used. Of this number, 137 were tested subjects, 84 who were referred without testing constituted a control group, and 37 were used in the pilot study which preceded the major study; this last group was also considered a "follow-up" group.

All testing was done under favorable environmental conditions, that is, in a testing room; and all the subjects knew that they were taking a test to be used by a specific watch factory for hiring purposes.

The data were intensively analyzed in three ways. First, the characteristics of the various criteria, as well as their interrelations, were studied. Second, the characteristics of the various indicators and their interrelations were studied. Third, the relation between the criteria of success and the test results was analyzed; this was the crucial step.

The correlations among the criteria indicated that each was measuring a relatively different aspect of success on the job. For example, the correlation between foremen's rating and salary ratio was +.13. The correlation between length of employment and foremen's rating was +.25. The correlation between salary ratio and length of employment was highest, +.44.

Four of the five measures of test performance—the time scores and qualitative performance on both tests—were established as reliable; but one measure, improvement, was not established as reliable. Comparing each intercorrelation of each of the five measures showed that all were low.

Eight were less than +.20 and one was only slightly higher. The only high intercorrelation was that between quality rating and total time of the tweezer dexterity test; this was +.71. However, quality ratings generally cannot be considered to be intimately related to speed because the correlation between the quality rating on the finger dexterity test and the total time on that test was only +.13. Low correlations among test measures and low intercorrelations among job criteria are actually more favorable than high intercorrelations. When such correlations are high, their predictive value is limited since all will be predicting the same thing. By the same token, if all the job criteria are highly intercorrelated, they will all be measuring the same thing instead of different aspects of success. The total time score on the finger and tweezer dexterity test generally had the highest prediction value of the job success criteria. Quality ratings on test performance were valuable for prediction in some instances, but improvement on the second half of the finger dexterity test was not predictive for any of the criteria. Some of the specific findings are as follows (*1*):

Quality ratings during testing for finger dexterity were not indicative of length of employment. But those with "average or below" ratings on the tweezer dexterity test were found in the shorter categories of employment. Sixty-one per cent of the group who received such ratings were no longer employed after four months and only 27 per cent of those who received "above average" ratings left or were dismissed within this period. The difference was statistically reliable and D/σ diff. was 3.6. When the quality ratings for both tests were combined and distributed according to length of employment, no statistically reliable differences existed between those rated high and rated low in test performances.

Low correlations were reported between the quality ratings on either dexterity test and salary ratios. The correlations were +.17 ± .11 for the finger dexterity test and salary ratios, +.15 ± .11 for the tweezer dexterity test and salary ratios, and

+.05 ± .12 for the combined quality ratings and salary ratios.

Quality ratings on the finger test were related to foremen's ratings of job performance with a coefficient of contingency of +.50. The C for tweezer quality ratings and foremen's ratings was +.24. A coefficient of contingency of +.30 was obtained when foremen's ratings were correlated with the combined quality ratings on both tests. (Maximum C = +.86).

Improvement on the second half of the finger dexterity test was not predictive of length of employment.

Improvement correlated with salary ratio —.06 ± .13. This is the only comparison of the entire investigation that shows a negative though unreliable relationship between test indicators and the criteria of proficiency.

Of the workers who received "A" ratings by foremen, 100 per cent showed improvement on the second half of the finger dexterity test. Of the workers who received "D" ratings, only 50 per cent improved. Eighty-four per cent of those who received "B" ratings improved and 61 per cent of those who received "C" ratings improved. The difference in per cent between those who received "A" and "D" ratings is not statistically reliable, possibly because of the limited number of subjects.

Time scores on both the finger and tweezer dexterity tests were faster on the average as length of employment increased. The D/σ diff. for the average time on finger dexterity test between the "less than 7 day" and the "more than 1 year" groups was 4.3. In the same comparison on the tweezer dexterity test the D/σ diff. was 2.5. Combining the finger and tweezer dexterity time scores did not increase the statistical reliability of the difference, and D/σ diff. between the "less than 7 day" and "more than 1 year" groups was 2.3.

The correlation between finger dexterity time score and salary ratio was +.26 ± .10; between tweezer dexterity time score and salary ratio it was +.32 ± .10; and between the combined test times and the salary ratio it was +.39 ± .09.

The "above average" group according to foremen's ratings was 5 seconds faster on the finger dexterity test and 9 seconds faster on the tweezer dexterity test than the "average and below" group. The difference for the combined test scores between the two groups was 12 seconds in favor of those receiving above average ratings. These differences were not statistically reliable.

The practical value of the critical scores (time score of 5′30″ or better on the tweezer dexterity test and 7′30″ on the finger dexterity test) which were suggested in the pilot study (*5*) is clearly indicated in this investigation. These scores discriminate employees in the watch factory with a considerable degree of exactness according to the criteria of proficiency. This will be indicated in the following summary.

A comparison according to length of employment showed that 7 per cent of the group that "passed both tests" left within one week, whereas 23 per cent of the "no test" group and 24 per cent of the group of workers who "failed either or both tests" were unemployed after one week. The differences in the percentages between the first and the last two were statistically significant with critical ratios of 3.2 and 3.4. The greatest possibility of prolonged employment was found in the group that "passed both tests." Of this group, 72 per cent remained four months or longer. This percentage was significantly different from that of the "no test" group (D/σ diff. of 3.1), and from that of the group which "failed either or both tests" (D/σ diff. of 4+).

A comparison according to salary ratios indicated that the group that "passed both tests" earned the most money. The earnings of this group were statistically different from the earnings of the group that "failed one or both tests," with a D/σ diff. of 5. The "no test" group was superior in salary ratio to the group that "failed either or both tests," with a D/σ diff. of 3.5. The group that "passed both tests" was superior to the "no test" group but the D/σ diff. was only .9.

A comparison according to foremen's ratings showed only a trend. The group that "passed both tests" was rated by foremen as "better than average" in 34 per cent of the cases. The group that "failed either or both tests" was rated as "above average" in 25 per cent of the cases. This difference was not statistically reliable. The D/σ diff. was .9. No differentiation between the "no test" group and the "passed both tests" group is possible according to foremen's ratings.

A follow-up of the subjects in the pilot study supports the findings of the present investigation that time scores on the tests are indicators of proficiency. Two years prior to the "follow-up" 20 workers were selected by foremen as superior and 17 as mediocre workers in the watch factory. These groups were originally differentiated in test scores with a critical ratio of the difference of 2.18 for the finger test and of 1.01 for the tweezer test. The size of the groups, of course, affected the significance of their differences. The D/σ diff. for the percentage discharged, which was the difference betwen 0 and 18 per cent, was 2. The D/σ diff. for the salary ratio was 3.7.

Before presenting a review of other studies, it is desirable to take stock and consider the implications of such research. The above study was not an "ideal" study. Because of factory conditions, it was impossible to use desirable scientific controls. For example, equal-sized groups in the various categories could have been arranged for in a laboratory more readily than in the factory. The demands of research must often conform to conditions in the factory, but only as far as planning and methodology are concerned. The statement does not hold for research conclusions, for these must be reported independently of plant conditions and must conform very strictly to the data obtained.

The industrial psychologist is justified in conducting laboratory studies only as a preliminary to the research in which the industrial situation necessarily becomes the "laboratory." Laboratory conclusions cannot be generalized and applied to the industrial scene without checking them in every way possible. Whether the problem involves tests for selection or any other purpose, the industrial psychologist often has to modify procedures and attack it in a manner that is unorthodox from the scientific point of view. If, for example, he will not forsake rigid controls in some cases, he may be forced to give up the entire problem. To the industrial psychologist, the lesser of the two evils is to conduct research in industry under the best conditions that industry can provide.

A further illustration of this point concerns desirability of having large numbers of subjects for an experiment. However, an industrial organization is often not in a position to hire on a large scale. In this case it is better to sacrifice the number of subjects rather than the entire study.

This principle does not imply that a form of research, euphemistically called "directed research," should be tolerated. Research reports must agree with the conclusions based upon the facts obtained. An industrial psychologist who does not report negative findings because this would create disrespect and might lead to his dismissal is as wrong as the business executive who wants the research to back up his sales ideas and therefore "directs" the research and its findings. After all, the monumental contribution made by the Hawthorne Studies could not have been possible had the research program not been flexible and sincere and the findings been reported otherwise than as they occurred.

The points just discussed are important and should serve as a means of evaluating not only test research but all other types of research in the field. To this end, a few additional studies on test selection will be described.

In his study of tests for selecting inspector-packers (7), Ghiselli used a battery of several tests on a group of 26 women employees working as inspector-packers in a pharmaceutical concern. There were five main duties in this job: filling containers, inserting stoppers, examining the contents by eye, labeling the containers, and packaging. The job, although routine, is extremely important, for the presence of extraneous material or incorrect labeling might result in serious illness or even death for anyone who happened to be sold the wrong product. The criterion of job efficiency was the combination of ratings by the forelady and the supervisor.

The job analysis indicated that the important abilities that should be measured in the preliminary battery of tests were:

1. Dexterity of fingers, hands, and arms.
2. Eye-hand coordination.
3. Estimation of the size and form of objects.
4. Ability to observe difference in details.

To this end a battery of six tests was administered to the employees. It was found that the average performance of the inspector-packers on these tests was vastly superior to that of samples of an adult population in the Minnesota Placing and Turning tests and the Paper Form Board test. Although this information is useful, selection is justified only when a relationship is found to exist between test performance and job performance. Such a relationship is called a validity coefficient. The Minnesota Paper Form Board test was found to be more closely correlated with the criterion than any other test in the battery; this test correlated to the extent of +.57. The Peg Board test correlated with the criterion to the extent of —.50, and the Turning test to the extent of —.40. The other tests had lower correlations with the criterion.

This study, like the one previously reported, has shortcomings. The criterion of proficiency was a rating by superiors; but, since it apparently was the only criterion available, it had to be used or no tests could have been given. Too often in industry, such ratings comprise the only available criterion. The number of subjects, 26, is small; but when we remember that this constitutes a large number of people performing the same task, this can be considered a satisfactory sample. The study presents no evidence on the success of its recommendations that were adopted for future use; such information, as well as recommended critical scores, is often helpful in evaluating the use of tests.

Edwin N. Hay (*8*), using a battery of tests, was able to predict 91 per cent of the better bookkeeping machine operators and 72 per cent of the less satisfactory operators. Prior to establishing these results, all the procedures involved in test research and development were followed. These included job analyses, establishment of adequate job criteria, preliminary selection of the test battery, and statistical investigations. Only after many years was it possible to recommend the particular test battery as successful for prediction purposes.

The job analysis revealed that the outstanding requirement for machine bookkeeping is bimanual ability. A detailed time and motion job analysis showed that there were five distinct operations which could be broken up into eighteen motions. The average time for the five operations—selecting ledger card, inserting ledger card, picking up previous balance, post-checking amount, and returning card—was 6.8 seconds. In most of these operations, the eyes and both hands are used. Speed and accuracy are required for the successful performance of this job. The difference between the ability of the best and poorest operators is greater than 2 to 1; that is, the best operators do more than twice the work done by the poorest operators.

The tests used included the Otis Intelligence test, the Minnesota Clerical test, the Ziegler Rate of Manipulation tests, and other tests of clerical ability such as filing and name finding. In all, 22 tests were administered. Although six of the tests were of the hand, arm, and finger dexterity variety, none of these six showed any considerable relationship with the criterion "speed of posting." However, the Otis test, the Minnesota Clerical Test-Numbers, and the Alpha Number series correlated +.50 or higher with this criterion. The multiple correlation technique indicated that the Otis test and the Minnesota Clerical had a correlation of +.65 with the criterion. The highest multiple correlation between the test battery and the criterion was +.71 and included the Otis, the Minnesota Numbers, the Alpha Number series, and the Fryer Name Finding.

Hay's study is valuable from many points of view. The evidence presented in the follow-up indicates that in this case the tests worked. Table 38 shows the steady improvement in the average production of bookkeepers since selection based on testing was introduced.

TABLE 38. Average Production of Test-Selected Bookkeepers

Date	Number	Average Production
October, 1937	43	105.0
November, 1939	40	108.7
April, 1940	30	109.7
December, 1940	32	110.2
December, 1941	26	110.9

A. Q. Sartain (*10*) administered a battery of seven tests to a group of 47 employees in the inspection department of an aircraft factory. The criterion was set by the ratings of the instructors in a refresher course being given to inspectors. The instructors were also familiar with the performance of these employees and their ratings undoubtedly reflected this knowledge. The test battery included the MacQuarrie, the Otis, the Cardall Test of Practical Judgment, the Minnesota Paper Form Board, the Industrial Classification Training test, the Bennett Test of Mechanical Comprehension, and the O'Rourke Test of Mechanical Aptitude. The multiple correlation of this entire battery with the criterion was +.787. However, three of the tests—the MacQuarrie, the Cardall, and the Minnesota Paper Form Board—yielded results equally as good, the multiple correlation being +.780. Since the difference between these two correlations is negligible, it would be advisable to use these three tests, rather than all seven.

John T. Shuman (*11*) administered a battery of tests to a group of employees and applicants for various jobs at the Lycoming Division of the Aviation Corp. The tests included the Otis, the Minnesota Paper Form Board, the Bennett Test of Mechanical Comprehension, the O'Rourke Test of Mechanical Aptitude, and the Minnesota Vocational Test for Clerical Workers. The employees tested included inspectors, engine testers, machine operators, foremen, and job setters, among others. Shuman reports that the average improvement in selecting excellent workers was 18 per cent with the Bennett test, 15 per cent with the Otis and 13 per cent with the Minnesota Paper Form Board. The critical scores that made this improvement possible meant the elimination of one out of every four persons tested.

The Bennett test when compared with the criterion (ratings) was found to be highly correlated to the job of job setter, the correlation being +.73. The Minnesota Paper Form Board correlated +.59 with this same job. The Otis test had the highest correlation with the job of engine tester, +.57. Shuman finds that the tests in his battery correlate better with jobs that require skills such as working on machinery precision parts or testing aircraft engines, rather than purely manual skills. He believes that tests can be more useful in assigning employees to job category levels than to specific jobs. An incidental finding, but one that deserves mention, is the fact that one test had to be dropped because of dissatisfaction on the part of the subjects. This was the O'Rourke Test of Mechanical Ability, which was too long and proved to be almost useless with women applicants, many of whom did not even try to take it. This emphasizes that a test battery must be favorably received by the subjects if any value is to be attached to the results.

Many other studies have been as effective as the few described above. However, further examples would only labor the point. The use of psychological tests in industry demands research and development in the light of the particular problem and the specific plant. The fact that this work has been done before does not make it unnecessary; it means that the chances of success are improved each time. The essential point is that test results must be correlated with job success; they can never be taken for granted.

Industrial testing requires a battery that is, first of all, brief. For the average factory and office job, a short intelligence test supplemented by one or two pencil and paper or performance tests is the usual procedure, and under adequate conditions it can be moderately successful in prediction.

Tests measuring personality characteristics or adjustment for industrial selection purposes are conspicuously absent from the test batteries now in use. There is one exception, however, and this is the work done in the selection of salesmen. Since this will be described in Chapter 20, it is omitted for the present.

Doncaster G. Humm advances the view that aptitude tests fit the worker to his job but not to his fellow workers. He believes that temperament testing is essential as a supplement to aptitude testing, and is enthusiastic over the industrial possibilities of the Humm-Wadsworth Temperament Scale. This test is an interesting variation of the inventory type of questionnaire with a slight clinical slant. The test is probably not as bad as some people in the field claim, but no substantial evidence that it is much better than most tests of this type has come to light.

An interesting approach to the problem of the validation of personality testing in industry is afforded by work done by Martin. He and Guilford constructed the Guilford-Martin Personnel Inventory and they have attempted to validate it by administering it to people employed in industry. Martin claims that troublemakers can be located through the use of this inventory (*9*). Three traits are measured: cooperativeness as opposed to faultfinding; objectivity, as opposed to personal reference; and agreeableness as opposed to belligerence.

Two hundred questionnaire items were constructed to cover the area of behavior believed to be connected with these traits, and the questionnaires were then administered to 500 men and women holding a great variety of jobs. Typical items in the questionnaire are as follows:

For Trait Co:
  Do you believe that most people shirk their duties whenever they can without appearing to do so?
  Do you feel that many young people get ahead today because they have "pull"?
For Trait Ob:
  Are you continually comparing yourself with other people?
  Do people near you sometimes whisper, or look knowingly at one another when they think you are not noticing them?
For Trait Ag:
  Do you believe that most people require someone to tell them what to do?
  Have you very much resented having friends, or members of your family, give you orders?

The questions were subjected to an item analysis and a weighted scoring system was devised. Two experiments were then conducted to establish the validity of the questionnaire. In one, the questionnaire was administered to a group of 51 employees of a California aircraft corporation. Here the test classified as having "undesirable temperaments" 82 per cent of the workers who, in management's opinion, had proved to be troublemakers or "soreheads." Only 38 per cent of the satisfactory workers were classified in the "undesirable" group.

In the second validating experiment, the questionnaire was given to 43 workers in a New York textile concern.

Thirty of this group were well adjusted and 13 were rated as malcontents. Eleven of the latter (85 per cent) scored in the 40th percentile or lower, based on the sample of 500 workers on the cooperative trait. However, 11 of the 30 well-adjusted workers (36 per cent) also were in this percentile category on the Co trait. Martin does not mention any results with the two other traits, so there is no way of knowing if they were valid to the same extent as the cooperative trait appears to be.

The questions in this personnel inventory, however, are of the type which employees can "fake" if they wish to; one wonders why employees answer these items on the basis of "the way they are," instead of the way they know "they ought to be." The test should be watched with interest, although it cannot at present be regarded as infallibly predicting troublemakers. The interesting point is the attempt to validate a personality test on people employed in industry. More of this work should be encouraged, for eventually someone will find the right answer to the problem.

A chapter on the use of psychological tests in industry would be incomplete without reference to the considerable work done by the United States Employment Service, especially during the war years. The staff of the Psychological Testing Division of the U.S.E.S. did a large job for industry. Its program was geared to the development and validation of a battery of its own tests and private industry was encouraged to use these tests for selection purposes. The Employment Service selected employees for various firms with the test batteries it developed.

The return of the management of the Employment Service to the individual states in 1947 brought much of the work under state control. However, some of the state employment services are taking advantage of the work done by the federal agency, and are themselves continuing the work, although industry is generally not aware of it.

Some state employment services send to employers, without any charge, applicants who have been given psychological tests. Of course, in many instances, the testing is not tailor-made to the requirements of a particular company and this may prove a disadvantage. But, desirable as it is to have the testing program fit the specific needs of a specific company, it must be recognized that many firms may not wish to spend money on psychological testing. Under such circumstances, the facilities offered by public agencies may be more beneficial than detrimental, provided some check on the usefulness of the test in the specific company is made.

Related to using tests for industrial selection is testing an inexperienced applicant to predict his ability to work in any one of a number of jobs or fields of work. A new General Aptitude Test Battery has been made available to the various state employment services by the U.S.E.S. (*6*).

The Battery consists of eleven paper-and-pencil tests and four apparatus tests. These tests are selected because they best measured ten of the abilities that are often required in the performance of jobs. These abilities are: verbal, numerical, spatial, intelligence, form perception, clerical perception, aiming, motor speed, manual dexterity, finger dexterity.

The Battery has been tried out so far on persons employed in jobs representing twenty fields of work such as engineering, general clerical work, complex equipment repairing, simple visual inspection, machine tending and feeding, etc. Scores made on the tests by individuals looking for guidance can thus be compared with the scores made by the successful workers in these 20 fields of work and the probable ability of the individual to succeed in each of the fields evaluated.

The purpose is to provide a measure of abilities that apply to a wide range of jobs so that the counselor will be able to predict the individual's ability to learn to perform the duties of any one of a number of jobs, in any one of a number of fields of work.

The General Aptitude Test Battery is planned to be used in two ways:

1. As an integral part of counseling where a measure is needed of the applicant's abilities in relation to the various fields of work in which he may have interest but no practical experience.
2. As a more orderly approach to the problem of developing specific batteries for the countless occupations for which selection tests may be needed. Those tests in the General Aptitude Test Battery which measure abilities significant to the successful performance of a given job can be administered as a specific aptitude test battery, and the other tests ignored.

SUMMARY

PSYCHOLOGICAL testing in industry has been widespread. Two valuable sources of information about its use may be found in the works of Brown and Buros.

Many companies have used tests to select as well as promote employees. Although a complete list of companies employing psychological tests is not available, there are many references to specific companies in the literature.

Some studies have been rather fully described, not because they represent "ideal" test use but to show the accepted and prescribed manner of introducing a test battery in industry and to demonstrate some of the legitimate limitations. Some of the research of Blum, Ghiselli, Hay, Sartain, and Shuman has been selected for this purpose.

The crux of the problem in industrial testing is the establishment of a relationship between test results and job performance which will make selection by tests better than the methods used previously.

Industrial test batteries must be brief. A short intelligence test and one or two pencil and paper or performance tests usually comprise the final test battery. Such batteries are usually given applicants for "run of the mine" jobs.

Personality testing, although important, has not been used widely in industry. This field will probably prove fruitful in the future. Martin's attempts to validate personality tests in industry are noteworthy and deserve serious consideraion, even though his inventory is not much different from the many questionnaires and inventories now available.

The United States Employment Service has developed and used a series of psychological test batteries in the selection of applicants for private industrial organizations. It has recently developed a General Aptitude Test Battery to measure aptitudes of inexperienced applicants.

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18. Consumer Research

THE importance of the consumer is being recognized more and more in the marketing, advertising, and selling of products, not because of mere altruism on the part of the manufacturer or seller interested in profits, but because it is good business. Knowledge of the consumer's tastes, needs, and desires enables the businessman to function more successfully, for he can thus provide what the consumer wants and does not have to try to force him to take what he has.

As business continues to develop on an increasingly large scale, the producer and the consumer tend to become more widely separated. As a result, the only knowledge the producer has of the consumer may be his own bias, casual contact, or personal impressions of his friends and relatives. Such information is likely to be extremely limited and therefore unreliable. In order to feel the pulse of the public, a scientific and systematic means of investigating the public's needs and desires must be used. Such a system is usually called market research. The author prefers the term "consumer research." The two are similar, but consumer research places the emphasis where it should be—on research for consumption by the consumer, rather than on research for marketing.

USES

ACCORDING to Lawrence C. Lockley *(1)* there are eight common uses for consumer research.

1. Testing new products.
   This often provides a basis for predicting success or failure of the new product and affords a comparison between it and the products with which it will have to compete.
2. Appraising the attitude of consumers toward established products.
   Knowledge of the satisfaction of the present customers for the product, and information as to whether younger people use it as much as older people gives an indication as to the continued success of the product.
3. Determining the strength of competitive products.
   Comparing one brand and the other competitive brands enables the producer to know how his product stands in relation to the competition.
4. Measuring the extent of the market for products.
   A product breaking into a field may be successful or not depending upon the extent of the existing market. This information is useful to the producer.
5. Finding new uses for products.
   The increased market for a product often depends upon the discovery of new uses; this type of research provides meaningful leads along these lines.
6. Determining marketing channels.
   Market research can often suggest leads for the more successful distribution of a product. Some products may not be sold through the mail but research may indicate that there are no obstacles to such additional distribution.
7. Checking the efficiency of distributors, wholesalers, and retailers.
   Checking with the consumer often indicates a discrepancy between the manufacturer's estimate of his distributors' efficiency and their actual efficiency. For example, in a gas station selling a particular brand of gasoline, there is often a vast difference between the

condition of its rest rooms as described in advertisements, and the actual conditions.

8. Determining unsatisfied needs of consumers.
   Research often indicates the need for certain products which are within the realm of the manufacturing and marketing process and which the manufacturer can readily undertake to produce.

Other authorities have proposed somewhat different uses and some have suggested more than eight. It should be emphasized that there is no particular magic in any one list. There are many uses for consumer research, and Lockley's list illustrates some of the more common ones.

EXTENT OF THE FIELD

THE field of consumer research is very broad and gradually shades into such different areas as providing marketing information at one extreme, and predicting election results at the other. To be arbitrary, at least six different fields use the same basic techniques of consumer research: the political field, the social field, advertising, selling, public relations, and housing.

The political polls conducted by Gallup, Roper, and Crossley are the most widely known examples of consumer surveys for predicting election results. There is a definite relationship between political opinion polling and consumer research. However, the big pollsters are not too happy about conducting political polls. They do it simply because market research is in its infancy and they must demonstrate their ability to predict accurately an event in the immediate future. They can use this as a selling point in offering their services to an industrial organization that wants consumer information about its products provided the accuracy of that information can be demonstrated.

Political opinion polling has stirred up a heated controversy and many attacks have been made on it. It is claimed that such polls, if reported dishonestly or if misinterpreted, can actually effect the outcome of an election. That this is not just idle chatter is shown by the fact that Congress has investigated polling methods. Wroe Alderson (*1*) has presented a very frank discussion of this topic. With a minimum of punch-pulling he describes the Roper, Crossley, and Gallup polls. Of the Gallup polls he writes: "The final forecast of the Gallup poll is usually so hedged that all the preceding field work and analysis seem futile. The accuracy claims are overstated and not warranted by the facts. . . . "This journalistic requirement has led to two unfortunate practices. One is an extreme form of hedging in final forecasts; the other is making specious claims of accuracy following elections."

Another form of consumer research is the social poll. The National Opinion Research Center, affiliated with the University of Denver, conducts a continuing poll on topics of interest to the consumer as a citizen. For example, Report No. 16, December, 1943, investigated the topic, "Are Wars Inevitable?" At that time, six out of every ten Americans with an opinion on this subject believed that there will always be war. The differences of opinion between age groups were insignificant, but more persons in the lower than in the upper educational, economic, and occupational groups tended to consider that wars are inevitable.

More intimately related from the industrial point of view is the consumer research done in the advertising field. Copy testing and measurement of the general effectiveness of an advertisement are commonly used means of evaluating advertising campaigns. Since the chapter on Advertising deals with this in considerable detail, only this brief mention is made at this point.

Consumer research has also been used to develop effective means of selling a product by determining the consumer's attitude toward the product, as well as its uses and price structure. In this way the practice illustrated by the popular slogan, "Macy's won't tell Gimbel's" can be counteracted. In other words, information about a competitor can be secured with considerable honesty and within the ethics of business. For example, the manufacturer of Brand A Coffee can determine brand acceptance as well as secure various other kinds of information about all the other competing brands by asking a series of questions beginning with "What is your favorite brand of coffee?" A department store may ask a sample of the population such questions as "What is your favorite department store?" "Why?"

Consumer research is also useful in connection with the public's opinion about a company. For example, if a company has a history of industrial strife because of a poor labor relations policy, this may give it a reputation that eventually spreads to at least some of the consumer population. It may result in a refusal to use the product or, worse, in the spreading of rumors about its inadequacy. Consumer research to determine the generalized attitude of the consumer toward either the company itself or people in it may provide leads by which, through concerted effort, this popular feeling can be changed.

With the housing situation as desperate as it is at present, more attention should be directed to determining consumer attitudes. In a survey for the *Architectural Forum* (6) an effort was made to estimate the prospective housing market by questioning consumers. This study attempted to differentiate between the "daydreamers," who comprise about one-third of the population, and people who are "rather realistic." The realistic group was much smaller, comprising about 7.5 per cent of the population, or approximately 2,778,000 families. The report is based on this group. The survey indicates that cost is perhaps the most important factor in determining the purchase of a house, especially among the low- and average-income groups. Fifty-two per cent said that they would spend somewhat less than $6000 for a home; only 11 per cent would spend $10,000 or over. In view of the discrepancy between the cost of houses at the present time and the consumer attitude expressed in this study, it is not surprising that few houses are being built, despite the intense shortage.

In another study of the housing field conducted by Blum and Candee *(3)*, two groups of families were equated for size of dwelling, income, size of family, educational background, and other socio-economic factors. The two groups differed in that one group lived in tenements and the other owned one-family houses. Such functions as sleeping, dressing, washing, and elimination were minutely investigated by the interview, inventory, and diary techniques. The major concern in this study was to determine actual space needs. For example, the inventory of a wife's clothing which was taken, could be translated into the amount of storage space needed. Such findings can answer questions as to the number of closets, drawers, and shelves needed. They can also lead to practical suggestions on the functional design of furniture and the more efficient use of a room. A survey of this nature is not far removed from research which can be put to marketing use. For instance, information about the average number of sheets, towels, dresses, and other items owned by families at various income levels can tell a manufacturer or an entire industry much about the development of potential markets or present needs.

Just as one can gain perspective on the scope of market research by considering the fields in which it has been conducted, so he can gain a similar perspective by knowing the different types of organizations that conduct consumer surveys. Such organizations can be classified under the following six heads: market research companies offering syndicated or private services, advertising agencies, magazine publications, manufacturing companies, government departments, and educational institutions. Only a few examples of the various organizations will be given; no attempt has been made to approach a comprehensive listing.

Some organizations offer syndicated or private marketing research services. They have clients for whom they conduct surveys, each client receiving a copy of their report. The Brand Barometer of the Psychological Corporation, the Hooper Measurement of Radio Audience and Sponsor Identification, and Gallup's American Institute of Public Opinion are typical examples.

The larger advertising agencies have their own research departments and the market research divisions play a large role in such research. Young and Rubicam and N.W. Ayer & Son are two of the many advertising agencies active in this field.

Some magazine publications such as Time and the Curtis Publications have their own market research divisions.

Another type of organization which often does consumer research is the large manufacturing concern. General Motors places considerable emphasis on the importance of consumer research.

Various departments of the federal government stress consumer research. The Surveys Division of the Bureau of Agricultural Economics, Department of Agriculture, has contributed much useful material to the development of the field. This division not only serves the Department of Agriculture but, during the war, conducted surveys for the Treasury Department and other branches of the government. Possibly the most outstanding contribution of this group has been the utilization of the "open-end" question. This type of question allows the respondent to answer in his own words. Those who use it claim that it avoids the dangers of suggesting plausible answers and further that it leads to a much fuller understanding of the respondent's attitudes.

One other type of organization that conducts consumer surveys is the educational institution. The Bureau of Applied Social Research, which is an outgrowth of the Office of Radio Research of Columbia University, and the National Opinion Research Council of the University of Denver are two of the more widely known endowed consumer research agencies.

When a group of people known as "market researchers" get together, people trained in many different professions are likely to be represented. Equally at home in the field of consumer research are the psychologist, sociologist, statistician, economist, journalist, and others who for lack of a better identification are called just "marketeers." It may be that in the future this work will be recognized as a separate profession. If this happens, it would be best for such an individual to have adequate training in each of the various professions now represented in the field. No single profession, by its background or training, is more eminently qualified than any other and each has a distinct contribution to make.

STEPS INVOLVED IN CONSUMER RESEARCH

ALTHOUGH there is no definite agreement as to the exact number of steps necessary to conduct consumer research, there is not a vast difference of opinion. Generally speaking, at least eight steps are usually necessary:

1. Statement of the problem
2. Methods of collecting data
3. Development of the questionnaire
4. Sampling
5. Supervisory and field worker training
6. The interview

7. Analysis of data
8. Report presentation
9. Payment of respondents

Statement of the Problem. Just as in individual therapy the patient's statement of his problem often fails to present the real problem, so in consumer research management's statement about the problem often does not give the real reason for the research. The problem is frequently stated in such vague terms as "a desire to increase sales." While consumer research may be able to secure data that will eventually lead to an increase in sales, the research organization must often aid the industrial concern to specify its objectives so that an effective procedure can be planned.

As an aid to a more objective statement of the problem, Blankenship (*1*) suggests a three-step process. First there is the situation analysis, in which a sufficient background of information is gained about the client, the industry, and the general problem. The second phase is informal investigation. Here emphasis is on exploration of the subject, and intensive informal interviewing of consumers or other likely individuals is carried on by experienced investigators to add to the background material. The third step is an integration of the first two and results in a statement of objectives. This restatement of the problem sets the stage for the study and avoids any misunderstanding between what the sponsor believes may be uncovered by the survey and what actually does result. There must be a clear statement of the problem and agreement between the researcher and the sponsor; otherwise the sponsor may be very dissatisfied with the results and be convinced that all the data collected represent a sheer waste of time and money.

Methods of Collecting Data. As soon as the exact nature of the problem is known, a decision must be made as to how the data will be gathered. There are four main techniques for gathering data—the telephone, the mail, the interview, and mass observation. Each has certain advantages and disadvantages. For example, the telephone is economical (provided long-distance calls are not made) but has the disadvantage of being unable to provide a true cross section of the population. Samples based on telephone subscribers do not include the large segment of the population in the lower socio-economic brackets.

The mail questionnaire also has the advantage of economy and allows the respondent to answer at his leisure. However, the replies always constitute a small percentage of the total number sent out and are most often typical only of the respondents, rather than of the entire sample. For example, a survey to determine the earnings of college alumnae clearly showed that the typical respondent earns more than the non-respondent. In this study the women who failed to respond to the mail questionnaire (the non-respondents) were repeatedly asked to do so, and a large enough sample of this group was thus obtained.

The third method of gathering data is the personal interview. The disadvantages of this method are the possible bias of the interviewer and the expense of conducting the survey. The advantages, however, are many, for face-to-face contact makes possible interpretations which enable one to evaluate the data more validly.

By and large, considering the advantages and disadvantages of each method, the best way to gather data is through the interview. If research is worth conducting at all, it should be done in the best possible manner. Telephone calls and mail responses leave too many loopholes, and much time and money can conceivably be wasted interpreting data that are neither reliable nor valid in the first place. The interview method is of course, no guaranty of the reliability or validity of the data, but adequate controls can be introduced to enhance their value.

The mail and interview methods have recently been combined in a way that successfully eliminates the disadvantages of each. A population is sampled by mail, and the people who did not respond are then interviewed. This procedure overcomes one common criticism of the mail technique—"The researcher does not know anything about the non-respondents"—and yet saves much of the cost of interviewing the total population.

The fourth method of collecting data is mass observation. This is not widely used but deserves mention because of its potential development. A person trained to observe group behavior can gather not only quantitative but even qualitative data. For example, observing customers as they enter a department store can yield information as to whether they make a beeline for a certain department or wander around. Watching people passing window displays can provide information as to the type of display which attracts crowds.

One technique that has been used only informally to the best of the author's knowledge but that could, with a minimum of energy, give valuable results, is the observation of people's reactions in a theater or movie house. A ready-made laboratory exists every time a newsreel is shown. In most theaters, applause, cheers, boos, and hisses are clearly audible. If the characteristics of the audience were known and this mass observation were carried on in a number of theaters varying both geographically and economically, measurement of the audible reaction might give valuable information as to the popularity of political candidates, etc. It might even spot trends in the popularity and unpopularity of such social phenomena as strikes, wars, sports events, etc.

Development of the Questionnaire. Data are often gathered by means of a formal or informal questionnaire. Developing a questionnaire is one of the most difficult steps in consumer research. The expert readily admits that a number of revisions are necessary. It is not exaggeration to say that, regardless of how experienced a person is, at least six revisions are likely to be required. Each questionnaire must be pretested. A good principle is to eliminate or change any question that is not clearly understood by the trial respondents.

Despite the fact that most people believe that an effective questionnaire can be constructed with ease, this is not true. There are many difficulties in the art of asking a question. A question must not be ambiguous. Although it may be clear to the person who asks it, it may not be clear to the person who must answer it. College students will agree immediately with this statement when they think of their struggles during an examination because they believed that any one of a number of answers could be given to a question but did not know which one the professor would regard as correct. In other words, his question was ambiguous.

Frequently words are introduced innocently into a question which either have no meaning to the respondent or can be interpreted by him in different ways. Such words as "often," "usually," and "sometimes" may mean the same thing to different respondents. The question: "What kind of oil do you use?" is ambiguous out of a context. It might mean auto, fuel, mineral, or household oil. Even if this were specified, the respondent might give the brand name or the weight. In each case, he would answer the question, but his answer might be useless to the researcher depending upon the specific information he desired.

A good question is phrased in specific terms and allows the individual to offer an answer without embarrassment. "How many razor blades do you use in a year?" and "How many times have you gone to the movies in the last year?" are difficult questions for the average person to answer accurately. Limiting the experience to one week would make possible a more accurate response. Limiting the situation to the week just prior to the interview would give even more accuracy; then all the researcher has to do is to determine whether that week is typical. If it is not, then he finds out how it differed from other weeks.

Questions should not be leading. As a rule, the respondent is more willing to agree than disagree; if he has some hint from the interviewer, he will be anxious to please. For example, if one asks the question: "Do you smoke Blanks?" many people will answer "Yes." Some may mean that they smoke Blanks regularly, others that they only smoke Blanks when they are offered them. If the respondent can answer the above question only with "yes" or "no," the data might indicate much wider consumption of the brand than is actually the case.

There are two types of leading questions but both have the same effect, the distortion of fact. Unintentional leading questions are unfortunate because they lead to erroneous conclusions. Intentional leading questions, such as those designed to convey the impression of wide use when it does not exist, are often used in "directed research" and are not only unfortunate but unfair.

The wording and form of a question may innocently distort the answer. For example, when people were asked "Have you read *Gone with the Wind?*" a large proportion of the respondents claimed that they had. A more accurate tally of the number of readers of that book resulted from the question, "Do you intend to read *Gone with the Wind?*" This gave those who had not read it an opportunity to say that they intended to read it; those who had actually read it said so.

Words, themselves are frequently loaded with bias and emotion. People often answer a question according to their response to a biased word. Such words as "force," "radicalism," "relief," "depression" often have different emotional connotations for different people and bias the answers in one direction or another. The presence of the word "Roosevelt" in a question would call forth a different answer from that which would be given the same question without this name in it.

Numerous studies have shown that the order of the question often determines the response. For example, the attitude of radio listeners toward advertising was more tolerant when the preceding question asked whether listeners should pay fees in order to eliminate the necessity for advertising.

Another factor which determines the results of a questionnaire is the type of answer the questions encourage. The percentages between "yes" and "no" responses will be different depending upon whether only these two answers are possible or whether three are possible, such as "yes," "no," or "uncertain."

Sometimes the respondent is asked to check one or more of a list of items. This procedure often confines the answer to the number of items on the check list; and if by any chance the most usual response is omitted from the list and space is added for "other," the most usual response is likely to be relatively rare. Care must be exercised regarding the order in which the items appear on a check list. Restaurants have conducted research on the relationship between their customers' orders and the position of food items on menus. They have found that some positions are preferred to others and result in that item being ordered frequently.

The development of a questionnaire is fraught with danger and is far from being as easy as it appears to be. Since the science of questionnaire building is not exact, it must be remembered that there is still an art to the task to be developed through practice.

Sampling. After the questionnaire has been made and pretested, it is ready for use. Who and how many people are to be asked to take it is a serious problem of consumer research. A good questionnaire administered to a faulty sample is useless. Further, the size of the sample must be determined so that the research can be conducted within the limits of the budget. Large samples, in and of themselves, are no guarantee of accuracy. Much has already been written about the ill-fated Literary Digest poll, which during 1936 conducted a presidential poll using a bigger sample than the other polls but which also made a greater error in predicting results than the other polls.

In the main, there are two types of sampling: *random* and *stratified*. In random sampling every fifth, tenth, twentieth, or one-hundredth name on a list is selected arbitrarily on the assumption that these people will, on the average, have characteristics similar to those of the total population. Hooper, for example, uses random sampling in conducting his radio audience surveys. In any particular city, his organization telephones every "x" name in the directory. The only time that a random sample is warranted is when a population is available all members of which have some specified characteristic in relation to the problem being investigated. For example, if the researcher wanted to determine the attitude of store owners who sell a certain product, he would be justified in visiting every "y" store owner who sells the product; he would waste time if he visits storekeepers who do not sell it. However, there are certain pitfalls in the use of random sampling, in addition to those already implied. For example, if an interviewer who is to visit every tenth household finds that the housewife is not at home, what is to be done? Certain identifying characteristics of the "not-at-home" may deserve consideration; and if only a random sample of the "at-homes" is used, different conclusions may result. It has been discovered that interviewers have more refusals from housewives in the lower socio-economic groups in the morning, and more refusals from those in the higher socio-economic groups in the afternoon. The housewife who is at home in the afternoon may have finished her daily tasks and be resting, and the one who is not available may be out visiting. Such factors as these often differentiate the socio-economic status of housewives.

Stratified sampling is used when certain characteristics of the population, known in advance, must be considered lest they unduly affect the results. The sample can be selected so that it will possess these characteristics in the same proportions as does the total population. Numerous controls are introduced in securing a stratified sample. The more obvious are geographic distribution, sex, age, education, income, occupation, and sometimes nationality and religion. A useful aid to any market researcher in this connection is the statistics of the United States Bureau of the Census.

In market research, the standard of living is an important aspect of stratification. However, most people are sensitive about stating their exact income—especially to a stranger—and hence other means to obtain such evidence must be used. Various indicators of family income can be obtained without asking the embarrassing question directly. Most authorities are in agreement that there are four economic groups: Group A includes approximately the highest 10 per cent of the population. Group B consists of the next 30 per cent. Group C includes the lower middle class and comprises 40 per cent. Group D represents the remaining 20 per cent, or the lowest segment of the population. However, there is some disagreement as to the specific indicators which best reflect these four groups. Among the more commonly used indicators here are rental or cost of dwelling, occupation, car ownership, number of electrical appliances and last, but not least, the intuitive rating of the experienced interviewer.

In stratified sampling, the interviewer is instructed in advance as to how many respondents are to be seen in the various areas of stratification. The returns must, of course, be checked to make sure that the sample has the same characteristics in relation to the over-all population.

Increasing the size of the sample can be effective only in reducing errors due to chance; it does not reduce errors due to bias. Bias errors can be eliminated through adequate stratification of the sample. Adequate stratification makes it possible to work very successfully with small numbers. It is not too farfetched to believe that the time will shortly arrive when even nation-wide surveys will be conducted accurately with as few as 500 respondents.

A relatively new development in the sampling technique is known as area sampling. The outstanding characteristic of the area technique is that a limited number of specific regions are intensively investigated, for it has been found that carefully selected small areas can be representative of many large regions. In area sampling the interviewers do not select their own respondents in order to fill specified quotas for different types or characteristics, but receive specific instructions regarding the households they are to visit. These households have been selected by means of stratified-random sampling.

In a study of war housing directed by the author, nine communities were selected as samples of areas throughout the United States in which there had been considerable war-housing construction. Lists of dwellings had been prepared on the basis of previously established characteristics of war-housing dwellings and the interviewers were required to obtain the information from these lists. It was assumed that it would be more advantageous to investigate each of these areas intensively than to spread the sample too sparsely over many more areas. Since the main point of the investigation was to determine the adequacies and inadequacies of war housing, it was possible to obtain this information from the nine areas selected.

The size of the sample is also an important consideration. There has been a tendency within recent years to minimize the magic of large numbers; in fact, some nation-wide polls at the present time are based upon as few as

2000 to 4000 respondents. There is considerable evidence to indicate that just as accurate a result can be obtained from a small sample like this, provided the characteristics of the total population are known.

Supervisory and Field Worker Training. The weak spot in consumer surveys frequently lies in the supervision of the field staff. Sufficient attention is usually devoted to the development of the questionnaire and the scientific study of the sample to be polled. However, all this good work can be invalidated unless the same attention is given to the selection of the field supervisor. The value of the data collected depends upon the ability of the interviewers and the supervision they are given. Every field survey should have someone who is in charge of the interviewing. This person's work should include such tasks as the selection of the interviewers, their general training if they are inexperienced, and specific training if they have had previous experience in methods of interviewing.

The field supervisor should be available to the interviewers at least once a day—and preferably in the field. There is no end to the number of unforeseen situations which arise and which often require the supervisor's judgment. For example, a housing survey conducted by the author was to include only "bona fide families," defined as husband, wife, and children living together but with no other adults in the household; however, it was necessary for one interviewer to contact the field supervisor for clarification of these specifications. Apparently, on the day the interviewing began, all the families met these specifications; but on the second visit, one housewife told the interviewer that her husband had left her but that she was willing to continue with the survey. Since the interviewer had been instructed to report all irregularities to the field supervisor, she reported this one. The supervisor ruled that this was no longer a family according to the accepted definition and, further, that the housewife had more than she could handle already.

Anyone who has done work in the field knows about the almost mad desire on the part of interviewers to find short cuts. The presence of the supervisor tends to curb this practice. The supervisor also collects the data from the interviewers and is therefore in a position to call any existing misunderstandings to their attention and to clear them up so that useless data will not be gathered in the future.

The most important unit of any consumer survey is the interviewer. The general practice has been to belittle the importance of the interviewer and to assume that adequate questionnaires can take the place of good interviewers. This is not true. Really good interviewers have fewer refusals—some even receive luncheon invitations from the housewives! The poor interviewer finds a greater percentage of people refusing to continue the survey; she also has a high percentage of "not-at-homes" which cannot be explained by the laws of chance.

The only correct way to carry on an interviewing project is to have a full-time permanent staff and to pay them adequately. The $1.00-an-hour rate—or the payment of so much per respondent—encourages applications from a large number of part-time or temporary people who are not concerned with the problem and feel entirely divorced from any of the needs of the survey. If a survey is worth conducting, it should be done in the best possible manner; and this demands that, despite the increase in the costs, a full-time permanent corps of interviewers should be included on the staff. If the particular agency is not able to keep its interviewers constantly in the field, they should be assigned to analyzing data. High-grade interviewers are equipped to do this—and often in a much more meaningful way, since they have the advantage of their field experience.

The Interview. Since a relationship exists between market research interviews and those held for other purposes, the reader is referred to the discussion of interviews in Chapters 2 and 3, for it applies to consumer research interviews.

Analysis of Data. Whether the amount of information gathered in the survey is large or small, it must be analyzed. For large amounts of data, analysis by machines is often most economical. For short surveys, or for surveys involving limited numbers of subjects, hand tallying is often preferable.

Whether machines or clerks are used, nothing can take the place of brains. A code must be devised which will include all types of answers, and it must be constructed in such a way as to allow a statistician readily to determine whether relationships exist between various parts of the data which have been gathered. Questions which depend on the answers to preceding questions must be tallied in that relationship. The most important principle in the analysis of data is that each item must be broken down into its most minute parts. Only after examining them in this infinitesimal form can the statistician properly begin to combine and integrate. If this step is not taken, he often loses sight of some meaningful relationships which do exist but have not been teased out of the data.

Report Presentation. Consumer surveys are eventually presented to top management. Although people in this group usually feel that they are too busy to read reports, they expect any report to have pictures and graphs and, most important of all, to be preceded by a one-page summary. They usually express pleasure at receiving the report on time, read the summary, look at the pictures, and refer it to one or more subordinates for careful study. To the extent that these subordinates consider themselves top management, they in turn do the same.

Students of market research must therefore be very careful in presenting reports. A scholarly and scientific work which is hundreds of pages long and thoroughly accurate is often treated unfairly as the product of a "long-haired philosopher." The form of a good consumer research report as dictated by top management is:

1. Summary
2. The problem
3. Sample
4. Method
5. Results
6. Conclusions

As stated previously, the summary must be brief. It is frequently advisable to have a journalist rather than a scientist write it, because the scientific writer often does not have the punch which the executive demands.

The problem should contain a clear statement of the purpose of the research. It is best handled in a paragraph or two, when possible.

The description of the sample should include not only the exact number of people studied, but also their outstanding characteristics, such as geographic distribution, age, economic status, educational level, and any other factors which are relevant to the conclusions.

The method should describe exactly how the data were gathered. Scientific research demands a clear description of the method so that it can be duplicated and verified. With consumer research coming to be regarded more as big business than a science, the tendency has been to keep the particular method used a secret. From the business point of view this is defensible, but from the scientific point of view it is reprehensible. There is no such thing as a secret scientific method; anyone who thinks he has one is most likely suffering from a delusion.

The result should be presented in clear and concise form. This is where the artist comes in, for only the most primitive studies now rely solely on tables. Graphs and pictures are as much a part of consumer research reports as "Superman" and "Mickey Mouse" are a part of our national culture.

The conclusions must be brief but can justifiably be more technical than the summary which precedes the entire report.

Some examples of questionnaires and reports are shown in Figs. 35–37.

Payment of Respondents. The discussion of fees for respondents is often regarded as virtual heresy. It seems to be axiomatic that everyone connected with consumer research will be paid some fee with the exception of the person who gives the information. There is a general objection that respondents cannot be paid because it will cost too much. A further objection claims that paying respondents will attract only people who are interested in the money they will receive. Both of these objections lack validity.

Payment, even a token consideration, assures the continued interest of the respondent, especially on longer surveys. In Blum and Candee's field study (*3*), data were gathered from 101 families and each family spent from five to seven hours giving information to the interviewers. These families were told that at the conclusion of the survey they would be given $5.00 in war saving stamps. Despite the ordeal of this long and involved investigation, only about 5 per cent of the families dropped out. It is safe to say that this drop-out rate would have been much higher were it not for the $5.00 token payment. Since this amount of money is not large, it is unlikely that these families were "working for" the interviewers. However, the novelty of being interviewed does wear off and people are likely soon to regard the interviewers as invading their individual rights. If the giving of information is tempered

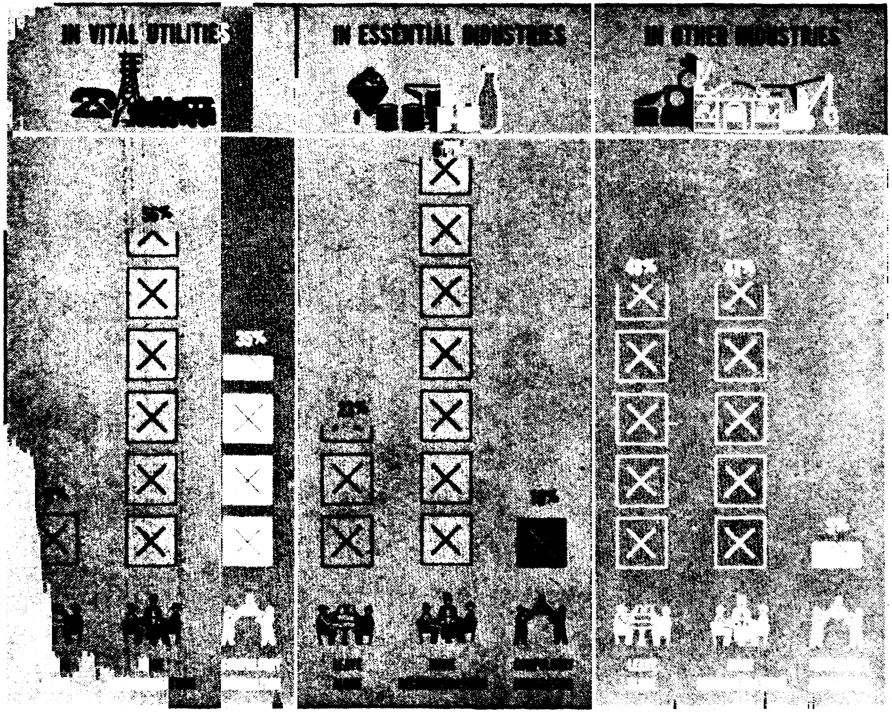


FIG. 35. How the Experts Voted. (By permission of the *American Magazine*.)

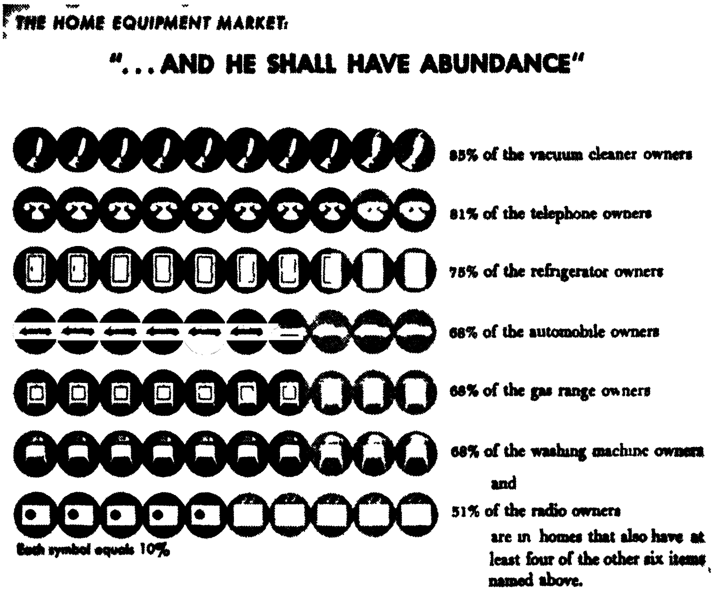


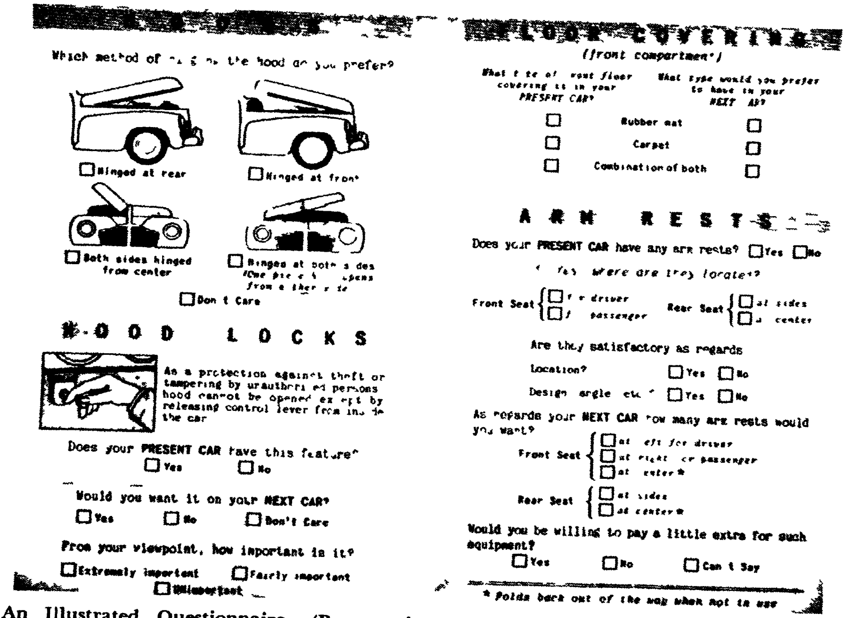
FIG 36. And He Shall Have Abundance (Fact Sheet No. 10, *Life* Market Research Fact Sheet Series, used by permission)

with a fee, the poll can be regarded as having a businesslike basis, which, in fact, it has.

SUMMARY

CONSUMER research has many uses in industry and in such related areas as the research, marketing, advertising, and selling of a product. The field, which is broad, also includes polls to predict political contests and to measure attitudes on public issues. Among the various organizations that conduct consumer polls are syndicated agencies, advertising agencies, magazine publications, manufacturing companies, government agencies, and educational institutions.

Consumer research requires a careful statement of the problem. There are at least four different methods of securing data, and for most purposes the interview is the most valid. However, this method requires trained personnel



[illegible]

Which method of raising the hood do you prefer?

☐ Hinged at rear ☐ Hinged at front

☐ Both sides hinged from center ☐ Hinged at both sides (One piece hood opens from either side)

☐ Don't Care

HOOD LOCKS

As a protection against theft or tampering by unauthorized persons hood cannot be opened except by releasing control lever from inside the car

Does your **PRESENT CAR** have this feature?

☐ Yes ☐ No

Would you want it on your **NEXT CAR**?

☐ Yes ☐ No ☐ Don't Care

From your viewpoint, how important is it?

☐ Extremely important ☐ Fairly important ☐ Unimportant

FLOOR COVERING

(front compartment)

What type of front floor covering is in your PRESENT CAR?		*What type would you prefer to have in your NEXT CAR?*
☐	Rubber mat	☐
☐	Carpet	☐
☐	Combination of both	☐

ARM RESTS

Does your **PRESENT CAR** have any arm rests? ☐ Yes ☐ No

If Yes where are they located?

Front Seat { ☐ for driver ☐ for passenger   Rear Seat { ☐ at sides ☐ at center

Are they satisfactory as regards

Location? ☐ Yes ☐ No

Design angle etc.? ☐ Yes ☐ No

As regards your **NEXT CAR** how many arm rests would you want?

Front Seat { ☐ at left for driver ☐ at right for passenger ☐ at center*

Rear Seat { ☐ at sides ☐ at center*

Would you be willing to pay a little extra for such equipment?

☐ Yes ☐ No ☐ Can't Say

---

* Folds back out of the way when not in use

FIG 37. An Illustrated Questionnaire. (By permission of General Motors' Customer Research Staff)

under constant field supervision. The sample of the population on which the study is based is obtained by either random or stratified sampling. Stratification prevents bias, provided the characteristics of the total population are known. Large samples are no longer necessary for valid results. A questionnaire is difficult to construct and requires pretesting in the field. The data secured must be subjected to minute analysis and all possible interrelations of items must be inspected.

The report resulting from a consumer survey has a typical format. It should be preceded by a brief summary and include pictorial presentation of the data.

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19. Advertising

PSYCHOLOGY can be an aid in effective advertising. Advertising, through suggestion, attempts to make people actually think in accordance with the advertiser's desires. Psychology studies the motivation, attention, interests, and behavior characteristics of people. The overlapping of subject matter in the two fields is evident, and the relationship between advertising and psychology is therefore close. The main value of psychology in advertising is its scientific methodology.

It must be made plain that advertising men are not necessarily psychologists. However, many psychologists are employed by advertising agencies. When a psychologist works in such a capacity, it is usually as a researcher. Wallace H. Wulfeck (*21*) describes the varied nature of the work a psychologist is likely to do in an advertising agency. The research people in an agency are primarily concerned with advising on the most effective way to present the values of a given product so that the advertising message will best penetrate the mind of the consumer. To this end the psychologist consults with various technical specialists in the advertising field. He also conducts consumer surveys to determine the acceptance or rejection of the products advertised, and to gain other information about consumer attitudes. In addition, he is expected to do much library research, analyze sales and distribution data, and document various claims.

The types of research projects conducted by an advertising agency vary tremendously. For example, in order to reach a feminine audience, a study may require investigation of biological, sociological, anthropological, and psychological fields to establish a factual basis on which to build an advertising campaign. An illustration is the specific investigation which required a knowledge of sexual attitudes, methods, prejudices, and taboos of women belonging to various religious groups and subcultures, in order to understand the motives against the use of Tampons for menstrual protection. Such information can result in the advertising appeals which will combat resistance most successfully.

Copy testing as well as evaluating the advertisement as a whole are often included in the psychologist's work. Such tests are made both before and after the appearance of the advertisement. Various methods have been developed to conduct such tests, among them being consumer juries, consumer polls, coupon returns, and readership study surveys.

A psychologist in an advertising agency may also be expected to discover new product uses. This is done through consumer polling, and through testing the product on controlled samples of a population. He is also expected to conduct studies on package design and recommend desirable features of various kinds of packages.

From the varied nature of the research that the psychologist may be called upon to do in an advertising agency, it is obvious that the major concern is not whether the research is of an extremely psychological nature as much as whether he is using scientific methodology to solve the problem confronting the agency.

It is, of course, essential that the psychologist doing research in this field never sacrifice his scientific standards. Some people, because of the pressure of commercialism, would like to have "directed" research performed; they urge that research results should be directed and slanted to conform with conclusions that are in the best economic interests of the firm. Such research is worse than tainted—it is a disgrace. Although no particular agency is suspected of conducting "directed" research, the idea of its being performed is not too remote in a highly competitive field. The point to be stressed is that research should not be a dishonest excuse for aiding business; rather, it must be honest and independent and thus directly or indirectly aid business by making positive and in some cases negative recommendations.

A psychologist may enter the field without being at all concerned about the advantages and disadvantages of advertising as a business. Many people praise advertising to the skies and insist that it results in better products at lower costs. Others insist with equal vigor that advertising is a parasite feeding on industry and that it dishonestly promotes business through wild exaggeration and false claims. Actually, advertising has demonstrated its usefulness; it is neither the angel some claim it is, nor the devil it is often painted to be. Anyone who has a strong feeling about the "viciousness" of advertising will never be happy in it. In many respects, it is a typical business—no better, no worse.

Sometimes, in the advertising field as in others, there is conflict between the psychologist and the executive. For example, the sales manager in advertising likes to have the ammunition that research can provide, but he may feel that the psychologist has been much too conservative in his interpretation of the data. He believes that they should be interpreted primarily in the light of his sales problems and that research should act only as a very subordinate aid. This conflict is not necessary. The president[1] of one large corporation whose primary concern is advertising happens to be a research psychologist. Obviously, to occupy such a position successfully, he cannot consider the research to be primary and all other aspects of advertising as secondary; he must find the happy balance between these two extremes.

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[1] Dr. Frank Stanton, President of the Columbia Broadcasting System; formerly research director of the company, and, prior to that, instructor in psychology in a midwestern university.

ALL ADVERTISING IS NOT PSYCHOLOGY

THERE is much information and material to be gathered in an advertising agency, much work to be done that is not psychological in nature. For these jobs, a psychologist, as such, is not qualified. For example, an important part of an advertisement is the copy. A psychologist does not necessarily know how to write copy; the best he can do is to test it after it is written. He may learn how to write it, but he will then be a copy writer rather than a psychologist. An important technical aspect of advertising is layout. The psychologist may be able to advise a layout man regarding the various factors which attract attention, but the fact that he is a psychologist does not mean that he is able to design a good layout. The art work and photography which play an important role in advertising are specialized and technical, and are best handled by experts in those fields. Selling the client on his need to advertise and arranging for handling the account are straight business. The psychologist is not necessarily a good salesman.

Many members of the advertising profession insist that their work is always done under pressure and considerable tension. Few fields are supposed to be more productive of ulcers than this one. The need to meet deadlines is always present, and the pressure is vastly different from that generally encountered by the individual doing academic research. Production problems must be handled, and it is rare that the psychologist, on the basis of his background and training, knows how to deal with them.

CONTRIBUTION OF PSYCHOLOGY TO ADVERTISING

In advertising, the purpose is to motivate the consumer to use the product being advertised. Since psychology studies motivation, psychologists can be of help to the advertiser. Much nonsensical material has been presented on motivation in relation to advertising. Generally speaking, advertisers have underestimated the complexity of human motivation; they have demanded simple lists of motives which will solve their problems. This is why the ill-fated "instinct concept" caught on in advertising the way it did. For a while the slogan in every advertising agency might have been "A good ad touches an instinct." Most present-day psychologists do not accept instincts as an explanation of human behavior.

For the past twenty-five years or more, the approach to motivation in advertising has been through the simple expedient of considering a list. Such an approach is not too meaningful. An individual never responds to one single motive; rather he makes a selection based on the myriad of motives acting on him at the same time. C. N. Allen has compiled such a list (*1*). However, he does not regard it with the same religious fervor shown by the compilers of other such lists. Allen drew up this list merely because a more or less arbitrary catalogue of motives can be useful to an advertiser. He maintains that such a list is useful as an arbitrary and rough approximation in describing customers in general, but he recognizes that every individual is always unique and hence does not exactly conform to the generalities in the list. Although all such lists are artificial and sterile, Allen's list is presented merely by way of demonstrating the type of lists offered as keys to consumer motivation.

Primary Wants	Appeals to Primary Wants
1. Appetizing food	Enjoy tastes, smells, sights, nourishment of food. "Meat on the table."

Primary Wants	Appeals to Primary Wants
2. Thirst-quenching drinks	Enjoy tastes and other refreshing qualities. "The pause that Refreshes."
3. Comfortable surroundings	Enjoyment of a better standard of living. "See the kitchen *Good Housekeeping* LIKES."
4. Escape from pain and danger	Basis for all negative appeal; prevention and remedy. "Feel that Knot of Pain Fade Away."
5. Sex companionship	Attractiveness to the other sex; romance. "Cigars Needn't Interfere With Kisses."
6. Welfare of loved ones	The basis of insurance copy: NOBLESSE OBLIGE. "My Daddy's Smart."
7. Social approval	Enjoy the admiration of others; prestige. "Now that's what I call good coffee."
8. Superiority over others	Satisfaction in excelling, socially in most cases. "How to win friends and influence people."
9. Mastery over obstacles	Satisfaction of ambitions; "will-to-power." "Are you flying blind?"
10. Play	Basis for travel, sports, and hobbies copy. "Play Winter Sports in Winter Sportswear."

Secondary Wants	Appeals to Secondary Wants
1. Universality	"Around the corner from everywhere."
2. Health	"Join the 'Regulars with Kellogg's ALL BRAN.'"
3. Efficiency	"More Free Time for Mothers."
4. Convenience	"No Need to Shift or Use the Clutch."
5. Dependability; quality	"Strong as the Rock of Gibraltar."

Secondary Wants	Appeals to Secondary Wants
6. Economy; profit	"Clipping this coupon saved him $17.92."
7. Style; beauty	"Make your figure lovelier the easy way."
8. Cleanliness	"Banish 'Tattle-Tale Gray.' "
9. Curiosity	"What Can a Man Believe In?"
10. Information; education	"What do you know about sheets?"

One concept of psychology that is important in advertising is attention. Such characteristics of an advertisement as intensity of stimulus, size, color, movement, repetition, novelty, etc., are factors that attract attention. This is a well-known fact. A good advertisement is one which uses to the greatest advantage the various techniques for attracting attention. Novelty and contrast sometimes contribute to the attention value. An advertisement which takes advantage of the "set" of the individual will attract attention. A "set" is a predisposing factor to action. For example, the use of sky-writing during the summer near a beach is more likely to be effective when the product being advertised is a sunburn lotion rather than a fur coat.

Another concept in psychology that is useful in advertising is interests and attitude. Advertising will be effective to the extent that the consumer has a strong interest in the product prior to the appearance of the advertisement. A person who wants to buy a suit will have a greater interest in such an advertisement than the person who is not in the market for a suit. On the other hand, frequent advertisements presenting one make of suit as the type worn by "men of distinction" may eventually create a favorable attitude toward that brand in the mind of the consumer. That particular make can become a status "symbol" to many who see the ads.

The core of all advertising is suggestion. Some advertisements are mild in this respect, suggesting rather subtly that you "try" the product. Others, however, are far from subtle. We frequently hear a radio announcer urge that we buy a carton of "Blub" immediately; in fact, run out *now* and get it—don't wait until tomorrow.

With the emphasis advertising now places upon research, advertising people have a tremendous desire to secure as much knowledge as possible about people's behavior in relation to their product. This has opened up the huge areas of consumer research discussed in the preceding chapter. Part of this knowledge concerns information about the consumer's socio-economic status. There is a relationship between economy and such things as the neighborhood one lives in, educational background, number of radios owned by a family, and number and types of magazines subscribed to. Such knowledge is useful to the advertiser who wants to reach the most people with the minimum of expense.

The most important contribution of psychology to the field of advertising has been the introduction of the scientific method, thus enabling conclusions to be based upon fact rather than on biased opinion. To this end, the psychologist has shown considerable ingenuity in modifying techniques to suit the needs of this field. Research in advertising has helped to make advertising more effective. No longer is it necessary to be guided by rule of thumb in solving the various problems posed by potential advertisers. Instead of relying on one man's opinion, the researcher can present facts and figures based upon a known sample with known characteristics, and hence may be much more accurate in predicting the success or failure of the proposed program. Because of this, advertising has become slightly more conservative. Fewer false and unsubstantiated claims are made both to the person who pays the bill immediately—the sponsor of the campaign—and to the consumer who pays it eventually. This is not to imply that advertising people are dishonest. However, they have been a little too enthusiastic and overconfident on occasion, for they sometimes believe that their experience entitles them to predict future behavior accurately. Research in advertising has tended to modify this view, with notable and desirable effects.

VARIOUS METHODS OF MEASURING ADVERTISING EFFECTIVENESS

COMPANIES planning to spend $10,000, $100,000, or $1,000,000 on a sustained advertising campaign have learned to want some of the answers in advance. Even the man who is sold on advertising will want to know whether to put the entire amount in a radio, a magazine, or a newspaper campaign, or to allocate funds to each of these media. It is not unnatural to expect that a man who sells radio time believes that his medium is the most effective, or the man who sells space in a magazine believes that the magazine approach is the best.

Of course, the solution to this problem is not to adopt an arbitrary position but to obtain the answer as a result of research. Such information can be gained from data on measuring the effectiveness of advertising. Among the many methods devised to measure this are the jury method, split-run technique, recognition test, brand preference, recall test, and sales test, including coupon return. The consumer jury method tests the effectiveness of advertisements before they appear. In this method, a sample of the population with the same characteristics as those who will see the advertisement is polled, the idea being to establish which of several advertisements will most influence them to purchase the product. Since the advertising expert is often willing to acknowledge that he cannot tell in advance which appeal will most interest the consumer, this method is widely used. For that matter, the consumer cannot tell which advertisement is best from a technical point of view; but to the sponsor of the campaign, technical effectiveness is worth little if the advertisement does not appeal to the potential purchaser. In other words, the best ad is the one which the consumer likes, rather than one which the expert believes best.

Guest (*4*) conducted a survey on the difference between magazine votes obtained by coupon returns and the consumer-jury personal interview. He found that the responses to preferred advertisements differ when a person is asked to select the better of two advertisements and when he is asked to choose the one which interests him most. Guest believes that the latter question gives a truer picture of the respondent as a consumer.

Another method of testing advertisements is the split-run copy technique, in which two or more forms of a given advertisement are alternated in different copies of a specific issue of a newspaper or magazine so that the various forms of the ad will be randomly distributed to the public. Thus two or more groups of the same population, equal in size as well as in various other characteristics, are subjected to the variable of a given form of the same ad. The relative pulling power of each form is measured by the number of replies received to an offer of a free sample or souvenir.

An example of a split-run copy test is reported by Manville (*12*), who attempted to determine the relative pulling power of the words "false teeth" vs. "dental plates" in the headline of an advertisement for a cleanser for artificial teeth. Two split-run tests were made in the New York *Times* Sunday Magazine Section by running advertisements, identical except for the change in the words in the headline, on the same day in the same space in different copies of the paper. "False teeth" yielded 51.4 per cent replies, and "dental plates" 48.6 per cent. Another split-run test was made at a later date, this time in the rotogravure section of the New York Sunday *News*. In this test "false teeth" yielded 52.5 per cent replies, and "dental plates" again ran second with 47.5 per cent. Apparently there is a slight difference in consumer preference for advertising carrying the words "false teeth" as opposed to "dental plates."

An important question in this technique, as well as in any other measure of advertising effectiveness, is how to interpret a small mathematical difference, that is, under what circumstances an obtained difference can be regarded as reliable or as negligible and attributed to chance factors. Zubin and Peatman (*22*) have proposed the use of a nomograph they have developed; it has great value in answering just such a question. When they applied the nomograph to Manville's data, they found that the differences recorded by him have no statistical significance. In other words, despite the slight mathematical difference in favor of "false teeth," these words cannot be judged as statistically superior to "dental plates."

Another means of gauging the effectiveness of advertising is to measure recognition of an advertisement that has appeared. In this method, a group of advertisements that the respondent could have seen and a group that he could not possibly have seen are presented to him in random order, and he is asked to identify all those he has seen. In other words, he has to recognize the familiar ones. The assumption here is that the advertisements that are recognized are better than the ones that have been seen but are not recognized. However, a peculiar error crops up in this method, for people claim to recognize advertisements that they could not have seen before; there is an error in identifying advertisements in the recognition test. Lucas and Murphy have conducted a carefully controlled experiment (*11*) in which one hundred advertisements were used. Fifty were from current issues of a magazine, and the other fifty were to appear in forthcoming issues of the same magazine. The authors found that 15 to 20 per cent of the respondents "recognized" advertisements which they had not actually seen. Moreover, the percentage of error did not vary greatly with the size of the advertisement. The percentage of error on a full-page ad in black and white and also on a half-page ad, was 20 per cent; on a quarter-page it was 17 per cent. Because of the wide variation in false identification of individual advertisements, the authors found it impossible to offer a general mathematical formula for correcting these errors. They conclude that these errors are due not to the respondent's attempt to mislead the interviewer or to faulty memory, but to the indifferent character of the advertisements themselves.

Advertising effectiveness is also measured by determining brand preference. According to Alfred C. Welch, one of the purposes of advertising is to establish an attitude favorable to the sponsor's particular brand of the product. Determining brand preference also tests the effectiveness of competitive advertising. A good way to study brand preference is to choose a product that has a number of brands all of which are equally accessible, similar in price, and otherwise indistinguishable with the possible exception of advertising. Welch made such a study (*18*) to determine the popularity of cigarette brands. He chose cigarettes because they meet the above qualifications. They are readily accessible and equal in price; furthermore, a number of independent studies have indicated that smokers cannot discriminate between any two popular brands of non-mentholated cigarettes. Anyone can conduct a carefully controlled blindfold test and establish findings similar to those reported by Husband and Godfrey in the *Journal of Applied Psychology* for 1934. Unpublished studies by the writer also established that the average smoker cannot differentiate among the popular brands.

The technique used by Welch was to ask his 322 subjects to name their favorite brands of cigarettes in order of preference. He found that 92 per cent of them ranked first in preference the brands that they were smoking at the time, and that only 3 per cent ranked these brands lower than second. Of interest in connection with this experiment is the fact that it was conducted at a time when Old Gold was sponsoring a contest to get people to buy Old Golds. During the contest, 10.3 per cent of the smokers Welch tested were smoking Old Golds, but only 6.1 per cent ranked this brand first in preference. Consequently Welch made a follow-up study to determine what brands the contestants were smoking after the contest was ended. This study was conducted before the winners of the contest were announced, thus avoiding any emotional reaction in the respondents. He found that 6.2 per cent of the respondents were smoking Old Golds. Welch interprets these data to mean that "brand preference" estimates preference more accurately than actual use, and he concludes that brand preference is more sensitive than a sales test in determining the results of advertising.

In another study (*19*), Welch analyzed the effectiveness of advertising in terms of four consumer attitudes—brand preference, brand familiarity, theme familiarity, and "theme credence."

Brand familiarity was determined by asking the subject to name five brands in response to a stimulus word, such as "cigarette" or "fountain pen." This differs slightly from brand preference in which the individual is asked to name brands in order of preference. Theme familiarity was estimated by asking the respondent to identify the sponsor of a particular advertising theme—for example, the sponsor of the theme "costlier tobacco" or "can't leak." In testing theme credence the respondent was asked a question to determine whether he believed the claim of the advertiser—for example, "What brand of cigarettes do you think uses the most expensive tobacco?" These four tests, according to Welch, make it possible to analyze an advertising campaign as to its effectiveness. Table 39 presents some of the findings.

TABLE 39. Summary of Test Results for Three Advertisements (*19*)

	Advertisement		
	Camel	Eversharp	Sheaffer
1. Increase in brand preference	3	6	0
2. Increase in brand familiarity	4	19	2
3. Theme familiarity (% correct)	47	56	36
4. Brand preference (correct) minus brand preference (incorrect)	9	13	2
5. Theme credence (%)	20	25	27
6. Association between theme familiarity and theme credence?	Yes	Yes	No
7. Brand preference (believe) minus brand preference (not believe)	14	27	20

Welch draws the conclusion that at the time of the analysis the Camel cigarette campaign was exerting only a slight effect on brand preference and brand familiarity, but that theme familiarity had been established fairly well. According to him, the total pattern presents a picture of advertising that has obtained results by sheer weight of quantity rather than by individual effectiveness.

With reference to the Eversharp Pen campaign, the total pattern pictures advertising that is effectively raising the status of a brand from its previously low position. On the other hand the Sheaffer advertising was ineffective, primarily because it failed to convince people of the validity of his claim—"more for your money." The recommendation here was that either the claim must be presented more convincingly, or a claim more capable of gaining acceptance must be used. The general plan of Welch's approach is to devise an analytic system of testing competitive advertising along clinical lines.

Another method of measuring the effectiveness of advertising is the use of recall. A commodity name is given and the respondent is asked to name any brand that he can recall. This is rather similar to the brand preference method but actually may be used more broadly. For example, after a person has seen a magazine, he may be asked to recall the advertisements in it, the assumption being that such retention is related to the effectiveness of the ad. After an order of recall has been established, the various advertisements can be analyzed to determine which factors in them had greater recall value. A further assumption is that recall is related to familiarity with the product advertised and also to ultimate use.

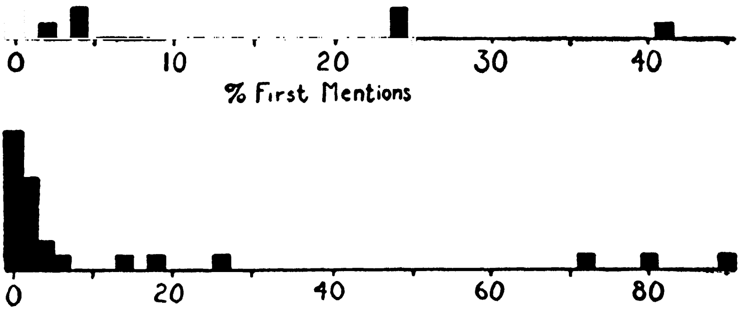

Fig. 38. Trade Name Familiarity. (From E. E. Ghiselli, *3*.)

Ghiselli (*3*) used this method to determine knowledge of various trade names for an assorted group of commodities. He found that there is a high correlation between the percentage of first mention and the percentage of total mention; this finding is very similar to those reported by Hotchkiss and Franken as early as 1923. However, depending upon which index is used, the conclusions drawn as to popularity of brand will differ. Fig. 38 shows that on the basis of the percentage of "first mention," one brand of fountain pen is apparently outstanding; but if the percentage of "total mention" is considered, there are two or possibly three outstanding brands.

Ghiselli's study illustrates the principle that interpretation of fact presentation is necessary regardless of the method used to determine advertising effectiveness and that, depending upon the scoring system used in a particular method, different conclusions can be reached honestly. This raises the question as to wherein lies the truth? At the pesent time, only opinion allows us to judge which of the two indexes used by Ghiselli is more accurate.

We must critically examine the results of research just as we must examine allegation not based upon data. Sometimes people who cannot be called "brilliant" come to conclusions based on research which are less valid than those formulated by others on the basis of their subjective opinions. Research is no substitute for brains; research plus brains is a good combination.

The last method of measuring the effectiveness of advertising is the sales test. Here, differences in sales volume before and after the advertising campaign are attributed to the effectiveness of the advertising. For products manufactured on a large scale and distributed on a nationwide basis, this method is often unreliable and requires too much time. Time lapses are often great between the sale of the product to the wholesaler, to the distributor, and finally to the retailer. Even if the advertising campaign is geared so that the retailer has the product when the advertisements appear, the lack of control of previous inventory and the time it takes for him to report back to the wholesaler contribute to making the sales test unsatisfactory as a means of effectively measuring advertising.

In order to cut down on the time required for checking sales volume, gifts and premiums are often offered to the consumer if he will return a coupon from the advertisement. These coupons make measurement possible. In Welch's study (*18*) previously referred to, rather conclusive data were presented to indicate that sales soar to an abnormal height during a contest and drop considerably after the contest is over. This is not to say that contests do not have their place in advertising. There is no doubt that a person can make money by using such a technique, but it is extremely limited as a means of measuring the effectiveness of an advertisement. At best, it merely measures the effectiveness during a campaign. Obviously there is a vast difference between these two situations.

The coupon is often used to check the effectiveness of advertising; the keyed coupon makes it possible to compare the effectiveness of one magazine to another. In a survey called "Four Billion Inquiries," Rudolph reached the conclusion that the average advertisement draws a coupon response from one-tenth of 1 per cent of the readers. The responses vary in direct proportion to the attractiveness of the offer. The most effective offer is a sample of the product and a recipe; this brings almost twice as many replies as the free recipe offer alone. The free sample ranks in between these two. Charging for the sample brings fewer responses than the free recipe, and charging for the recipe brings the fewest responses of all.

Studies which have been conducted show that a good number of the coupon clippers are repeaters and that people gather coupons to get as many free samples as possible. Others are habitual clippers and send for anything. Still others actually use the product and are taking advantage of this opportunity to get it free instead of paying for it. Children who do not receive sufficient quantities of mail often send in coupons so they too will get mail. The remainder of the population who mail coupons are those whom the advertisers are primarily interested in reaching, but they do not constitute too great a percentage of the total.

It is also known that there is a relationship between coupon returns and the weather. Coupon returns are lowest in December, when people are busy with Christmas gifts, and greatest in February when they have more time to stay home and send for samples.

TECHNICAL PROBLEMS OF ADVERTISING STUDIED BY PSYCHOLOGISTS

In addition to their attempts to measure the effectiveness of advertisements, psychologists have conducted useful research on such varied items as the effect of color in advertising, the use of illustrations, the value of trade names and trade-marks, and characteristics of people who read ads. Kitson, Kaiserman, and more recently Klapp (7) have at various times studied the use of illustrations in magazine advertising by means of the historical method. In this method, representative samples of advertisements are analyzed over a period of years, and trends are noted. Whereas pictures of people were used in 22 per cent of all ads in 1900, in advertising, this had increased to 74 per cent in 1940. The trend in using illustrations has been to depict people in functional relations to the commodity advertised. Klapp offers the hypothesis that this trend is valuable because such use of illustrations has imitation value; depicting a commodity as it is used, enjoyed, or recommended by an individual possibly causes other people to indulge in imitation. Fig. 39 shows the trend in the use of illustrations for four periods during the years 1900 to 1940.

Trade names have assumed such importance in advertised brands that some names are currently thought to be worth millions of dollars. The advertiser tries to find a trade name that people will readily recognize and recall, and he assumes that this leads to readier acceptance of the product. An interesting study was conducted by Jenkins (6) on the confusion between trade names and generic names. It is commonplace knowledge that a trade name may be accepted by the public as a generic name for a whole class of articles; for example, Kodak, which is a trade name,

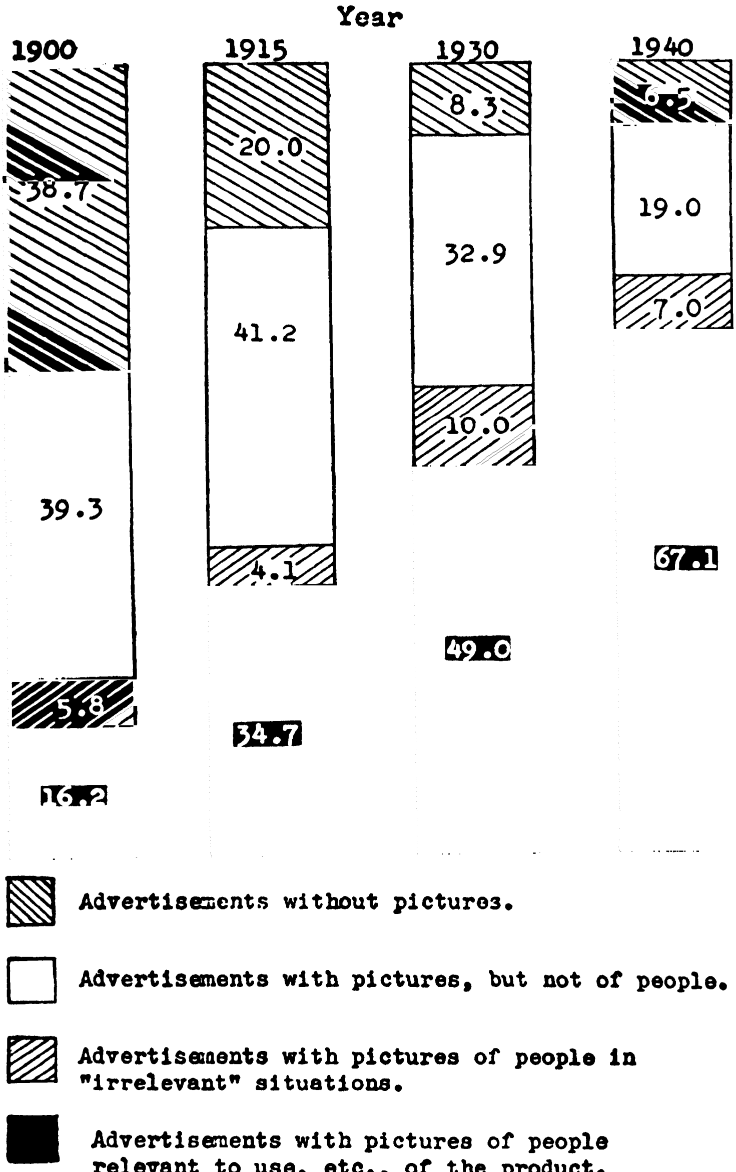

FIG. 39. Trend in the Use of Illustrations. (From O. E. Klapp, 7.)

is widely employed as a generic name for cameras. To test the extent of confusion between trade names and generic names, Jenkins surveyed two groups of college students. He found that there was no confusion as far as Kodak was concerned for these subjects knew it was a trade name, possibly because of the advertising slogan, "If it isn't an Eastman, it isn't a Kodak." On the other hand, more than two-thirds of these subjects incorrectly named dictaphone, mimeograph, and thermos bottle as generic names rather than the trade names they are. This suggests that advertising can be so effective as to defeat its own purpose unless particular attention is given to identifying trade names rather than the commodity itself.

Foley (*2*) used a modification of the free association technique, in which the subject says the first word that comes to his mind, in studying the value of trade names. He gave the stimulus word "Pepsi-Cola" to college students, and each subject wrote down a response. For two other experimental groups the stimulus words were "Coca-Cola" and "Dixie-Cola." The most common response to Pepsi-Cola and Coca-Cola was the word "drink"; but the most common response to Dixie-Cola was "Coca-Cola." Foley found that there were more Coca-Cola responses to the other "colas" than there were other cola responses to "Coca-Cola"; this can be interpreted to mean that the subjects tend to think of Coca-Cola when they hear the name of another cola product. Among the specific responses, the word "thirst" occurred only twice, but not in response to the stimulus "Coca-Cola," even though the advertising slogan of this product is "Thirst knows no season." One free association response was the word "awful."

The trade-mark tends to identify the product with a familiar picture or design. To aid this identification, the trade name is frequently combined with the trade-mark. In a study of which characteristics of trade-marks produce greater familiarity with the product, Wetteroth (*20*) took black-and-white photos of various trade-marks for such industries as automobiles, cigarettes, tobaccos, and breakfast foods. He asked a group of subjects to identify the products from these pictures. The leader, or the most widely recognized trade-mark, in automobiles it was "Pontiac"; in tobaccos it was "Raleigh"; in cigarettes it was "Camels"; and in the breakfast foods it was "Aunt Jemima." The characteristic which seems to be outstanding in each of these leaders is that the name of the brand can readily be depicted by the trade-mark. Pontiac uses an Indianhead, Camel the picture of a camel; Sir Walter Raleigh and Aunt Jemima are the names of the characters shown. This shows the value of having a direct tie-in between brand name and trade-mark.

It is a well-known axiom in advertising that color pays. But how much more effective color advertising is than black and white is wide open. A thorough and careful experiment on the value of color in advertising is reported by Warner and Franzen (*17*). The study was based on slightly fewer than 1000 subjects representing a stratified sample of people in the United States. Ten pairs of advertisements appearing in a weekly magazine were used; each pair consisted of a full-page black and white and a full-page four-color advertisement promoting the same product under the same trade name. In addition, these authors used four-color and black-and-white advertisements for the same product but under different trade names. There was considerable uniformity among the advertisements used in this study because they were prepared by the same advertising agency. All were full page, all appeared within a four-month period in a magazine with a large circulation, and all the sponsors were under the same pressure to utilize space to advantage. The only factor deliberately contrasted was the four-color advertisement vs. the black and white.

Warner and Franzen tested one-half of their sample on black-and-white and four-color advertisements of each of the products, and found that in interest value, color usually outweighed the black and white. They conclude, "Obviously the value of color in advertising depends upon a number of matters, such as the skill with which it is used, the adaptability of the product for black and white portrayal, and so on. These tests indicate a further consideration, the purpose of the advertiser. They suggest that in promoting a new brand or creating an association between product and trade name, color is not necessarily greatly superior. However, in protecting an investment in a familiar brand by maintaining and increasing its reputation for quality, color appears to have an advantage over black and white. It is possible that careful review of purpose in relation to the added cost of color may help to curb the trend toward uncritical selection of expensive presentation.

Another problem for the psychologist is the effect of advertising on children. Anyone with young children knows that a strong rival of nursery rhyme songs on the part of children is the radio jingle in the guise of the singing commercial. In fact, the jingles about "Blue Ribbon Ice Cream" or "Pepsi-Cola" or many other products cannot be dismissed without pondering the effects on our future consumers. It may be that the psychoanalysts of the future will uncover many early memories about the unconscious influence of advertising.

Guest (*5*) has attempted to determine the age at which brand awareness appears. Using a group of over 800 pupils in various grades of various schools, he administered an "awareness test." For example, the word "Texaco" appeared with the following five items after it:

Coffee
Automobile
Tire
Gasoline
Don't know

TABLE 40. The "Mental Age" of Advertising

Age at which 76% Knew Brands	Product
7 and 8	Cereal Automobile
8½	Gasoline
9	Soap
11	Magazine
11½	Store Tooth paste Bread
14	Coffee
15	Gum
15½	Tire
16	Watch Typewriter
18	Radio
Never	Razor

The subject was asked to respond with one of these five. Guest found that the number knowing the brand increased with age for all products except cereals. The reason for this difference in the case of cereals is that over 90 per cent knew cereal brands even at seven and eight years of age. Apparently the box-top technique, in which the box top is sent away for a magic ring, airplane, or some such souvenir, appeals to the children very early. Whereas between zero and 25 per cent of the subjects were familiar with brands of radios, watches, coffee, and typewriters at the ages of seven and eight, over 75 per cent of the eighteen-year-olds knew these same items by brand name. Table 40 presents the various products according to the age at which 76 per cent or more showed brand familiarity; this table might be referred to facetiously as the "mental age" of advertising.

Guest found that children in the lowest economic groups were not as familiar with brand names as other children. Children with higher I.Q's were more familiar with brand names than others. Since, with one exception, brand awareness bore no relationship to the number of siblings in the family, brand awareness may be assumed to be the result of the advertising rather than of older children making the younger ones advertising-conscious. It may well be that advertising to children is effective in terms of their future acceptance of the product when they become adults. Any parent knows that it is also effective in the present, since only those cereals which have the magic something or other are "good" according to the child.

RADIO

Whereas magazine and newspaper advertising appeals to the sense modality of seeing, radio appeals to the sense of hearing. Which will be more effective is often an important problem for the advertiser who must decide whether to use one or both media. If he uses both he must also decide how best to allocate his funds. The problems of radio advertising as compared to magazine advertising are many. For example, an audit of circulation figures will tell the advertiser how many people regularly buy the magazine; a consumer survey will indicate how many people read each issue of it. But to determine how many people actually listen to a program on the air is quite a different problem and must be attacked in a different way.

The important question regarding the effectiveness of radio advertising is whether the radio program actually sells the product. In a detailed experiment, Stanton (*16*) shows conclusively that radio programs do sell products.

He based his study on a radio program that was broadcast over a limited chain for a six-month period. The two markets he used were approximately alike with respect to population, size, retail sales, and retail outlets. They differed primarily with respect to radio advertising, since in one market the product was advertised by a radio program and in the other market there was no such program. The survey reveals that the sales were 88 per cent greater in the radio market than in the non-radio market. Stanton obtained this figure by sampling 20 per cent of the dealers in each market; he secured exact sales figures from an actual count of the dealers' inventories and sales records. In the radio market, 2455 sales were made as compared with 1407 in the non-radio market. Analysis of sales in the radio market revealed that the brand had a sale 81 per cent greater than the next most popular brand among the listeners; among the non-listeners, the sale was only 7 per cent higher. This was determined by phoning the families while the program was on the air and interviewing them later. Stanton found that the sale of the brand to "day-to-day" listeners was 363 per cent greater than that of the nearest competing brand; for non-listeners it was 59 per cent higher. This study indicates that the more one listens to a program, the more he purchases the product advertised.

The question as to whether there is greater memory for material which is visually presented as compared with material presented orally has been studied in numerous experiments. Most of these studies agree that material presented orally has greater retention value than material presented visually.

Measuring the size of the radio audience is one means of ascertaining the popularity of a program and has been given considerable attention. It is assumed that a relationship exists between program popularity and advertising effectiveness. The most popular method of determining audience size is by telephone calls. One form of this, the telephone coincidental technique, is used by Hooper and results in the well-known Hooper ratings which all the radio stars worry about. Every X name in the directory of a particular city is telephoned to and asked about the radio program being listened to at the time of the call. In another somewhat similar method the telephone call is used as the source of data, but the respondents are asked about radio listening over a given period of time. Although the telephone technique is widely used, it is far from certain that it is the best method, because only a comparatively small number of families in the low-income groups have telephones and hence a sample of only telephone subscribers is a biased sample from the point of view of socio-economic status. Furthermore, little if anything can be learned in this way about the status of the respondent and his family.

Another technique for measuring audience size involves the attachment of a mechanical device to the radio. One such device is the Neilson Audimeter, a recording apparatus that is wired into the radio and records both when the radio is on and the station to which it is tuned. The difficulty with such devices is that having a radio on does not guarantee that anyone in the household is actually listening to it.

Interviews are also used to measure the size of radio audiences, but in addition to the cost there is the problem of errors in recall which lead to misinformation being given to the interviewer. Sydney Roslow has developed a technique using the personal interview which he calls the "roster method." The interviewer establishes the time that the respondent was listening to the radio and then presents him with a complete roster of programs for each fifteen-minute period mentioned. In many respects this method has many advantages over the others as far as accuracy and meaning are concerned.

Just as there is no single outstanding and effective means of measuring the value of an advertisement, so there is no one method that accurately measures the size of radio audiences. Both these problems are awaiting solution, and the person who finds one will be handsomely rewarded. To date, the writer does not have even a "bright idea," but he hopes his readers will.

There are many other problems in radio research that cause the sponsor considerable concern. Both the need for better methods of pretesting a program and research conducted by radio stations to improve the kind of programs on the air have resulted in the invention of the program analyzer by Stanton and Lazarsfeld. This very simple and yet in some respects ingenious machine measures the reaction of a radio audience to programs. Essentially it is a simple modification of the polygraph. The subjects are seated and listen to a radio program; their hands are near two buttons, one green and the other red. The listeners are instructed to press the green button if they like what they hear, and to press the red button if they dislike any part of the program; they are to keep the respective buttons pressed down as long as the part of the program they either like or dislike is on. When the subjects are neutral, they do not press either button. The button is attached to a needle that moves in one direction or another, and this movement is recorded on a revolving drum. Since the time is also recorded on this drum, the parts of the program which the audience likes and dislikes can be determined. Naturally, the program analyzer does not indicate why a particular part of any program is liked or disliked, but it furnishes leads which enable such facts to be established in interviews. It has been widely used in the pretesting of radio programs, especially by the Columbia Broadcasting System, and, more recently, in pretesting motion pictures as well as plays. The utter simplicity of this device, which is affectionately called "annie" in the industry, is very impressive and the technique has great value.

There are many stories about the value of the program analyzer. One woman had been broadcasting on a recipe program over a certain station for a long time. During one of the tests in which the program analyzer was used, she happened to mention something about a visit, and the analyzer immediately registered a change in the receptiveness of the listeners. The interviews that followed the test revealed that the audience thought her voice more in character when she was talking about the trip than when she talked about recipes; she just did not sound like a housewife. Needless to say, her program was changed, with great success for all concerned. The result using the analyzer on one radio program is shown in Fig. 40.

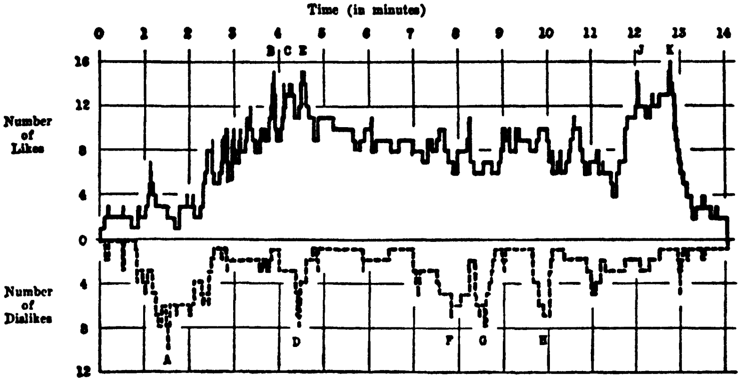

FIG. 40. Program Analyzer Results. (From J. N. Peterman, *14*.)

The psychological role of the daytime serial, children's programs, and other types of programs is of vast interest to the radio executive as well as the educator, and is the subject of continuing research. Another field of research that concerns radio people is the relationship between the physical quality of the sound and its psychological qualities, that is, the tonal range preferred by an audience. Do listeners like a wide and complete tonal range, or do they

EXTREMES OF "LIKES" AND "DISLIKES"

Of 52 Subjects Judging the Public Affairs Weekly Program

Program				Average Percentage†		Typical Comments
Part*	Time	Medium	Content	Likes	Dislikes	
A	1′ 29″–1′ 31″	Organ	Loud Chords	5.8	19.2	"It was too weird . . ." "I didn't think organ music was fitting there."
B	3′ 33″–3′ 50″	Narrator	"A man's home is his refuge . . . a secure nation is a strong nation."	21.8	4.8	"It's the principle that underlies that thought . . . I believe them very firmly." ". . . I know it's true . . ." "I liked the voice . . . it was very earnest."
C	3′ 58″–4′ 20″	Narrator	Elaboration on the right of trial by jury.	24.9	5.8	"The wording of it . . . We all feel we have a right to life, liberty and so forth." "I believe in it. It is the only fair way."
D	4′ 20″–4′ 30″	Chorus	". . . America was built on man's promises to man . . ."	22.9	13.5	"I dislike the quality of the voices and the sensationalism . . ." ". . . it sounded awfully stilted."
E	4′ 30″–4′ 40″	Narrator	". . . the American way of life . . ." "No tyrannies, no injustices, BUT—"	27.1	6.9	". . . the American way of life. . . . My ancestors have lived here since 1678 . . ." ". . . the way he appealed to you personally: 'Listener—.' "

F	7′ 48″–8′ 0″	Dramatization	Cop breaking up open air meeting.	12.9	11.9	". . . It's just loud nonsense . . ." "The presentation . . ." ". . . It was shouting to me . . ."
G	8′ 16″–8′ 36″	Chorus	"There was a time when men could gather . . ."	12.3	13.3	"It was going nicely and all of a sudden you get that rasping crowd."
H	9′ 35″–10′ 5″	Chorus	"This is a strong nation . . ."	16.9	9.6	"I dislike the presentation . . . the chorus of voices annoyed me . . ."
J	12′ 0″–12′ 5″	Narrator	War hysteria generates suspicion.	27.0	4.6	". . . because it's true . . ." ". . . we *are* over suspicious . . ." ". . . the only voice in the broadcast that seemed . . . real."
K	12′ 45″–12′ 50″	Narrator	". . . We are a strong nation . . ."	30.0	1.9	"I was feeling very patriotic . . ." "I like his voice. It wasn't so dramatized." ". . . sounded very rational and just."

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* The letters refer to those on the graph.

† These are averages of the percentage of the subjects who registered "likes" or "dislikes" in each second of a given part of the program.

prefer it to be held within limits? There are many fields connected with radio that will be considerably developed in the near future. Intensive research on people's attitudes toward FM and television is now being carried on.

An outstanding collection of articles describing the varied nature of radio research appeared in two issues of the *Journal of Applied Psychology*—February, 1939, and December, 1940. Paul F. Lazarsfeld served as guest editor. Students interested in research in this field will find their time well spent in referring to these issues of the *Journal.*[1]

SUMMARY

THE main value of psychology in advertising is its scientific methodology. The psychologist in an advertising agency is called upon to conduct research on a wide assortment of problems.

Consulting a list of motives in an attempt to understand advertising appeals is generally fruitless because many drives operate within and on the individual at the same time. Furthermore, most lists are artificial.

Various methods are used to test advertising effectiveness; among them are the jury method, the split-run technique, recognition test, brand preference, recall test, sales test, and coupon return. Brand preference, trademark identification, the use of color in advertising, the value of illustrations, and trade-name confusion are a few of the technical problems in advertising that psychologists have studied by means of research.

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[1] Most readers may have noticed that practically all the research references in this chapter are from the *Journal of Applied Psychology.* The author has done this deliberately, although he has not excluded other references because they are not valuable. Often, however, the tendency in the field of advertising is to minimize the role of the psychologist in the belief that all advertising is psychology and, what is worse, that everyone in advertising is a psychologist. Nothing is further from the truth. In order to demonstrate the kind of problems psychologists are concerned with in advertising in all media, the author took his references primarily from the *Journal of Applied Psychology* on the assumption that what is published there is psychology.

The effect of advertising on children is considerable. Many advertising campaigns are slanted toward them. They can influence their families to buy, and they may be conditioned in their own future buying habits.

The radio has resulted in research methods to measure size of audience, effectiveness of program, and other problems peculiar to the field. The program analyzer is valuable as a means of understanding the likes and dislikes of the radio audience.

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20. Selling

THE field of selling is rather closely related to consumer research and advertising. As we have seen, one of the objectives in consumer research is to determine the wants and needs of the potential buyer. The salesman who is fortified with this ammunition is aided in achieving his objective.

Sometimes it is exceedingly difficult to differentiate between advertising and selling. Most advertising is indirect selling, but some of it is rather direct. In any event, its main purpose is to sell the customer the product or institution, or at least "soften him up" for the sale.

Experimental investigations in the sales field have lagged behind such work in the field of advertising. The methodology of selling has not been inspected as rigidly as has the procedural development in consumer research. Because of this, psychology has not up to the present particularly contributed to the subject of salesmanship, except in the selection of salesmen.

A restatement of the meaning of psychology is in order here, since the relation between psychology and salesmanship is often misunderstood. Psychology gathers facts about human behavior by using the experimental and other acceptable scientific methods. It is not synonymous with "common sense" nor does it explain behavior on the basis of the concept "human nature." Many who do not understand the substance of psychology confuse it with any analysis of human behavior along non-scientific lines. The field of selling offers a good illustration of the use of "psychology" to explain behavior when psychology is not involved. This does not mean that a valid psychology of selling will not be developed in the future. The work done by psychologists will surely have fruitful results, provided scientific methodology is introduced and generalizations are based on data rather than speculation.

The basis for a psychology of selling should be the dual character of salesmanship. Salesmanship may perform a useful service in our society but it may also cause conflict. Thus it not only provides an income for some people, but also enables the consumer to satisfy both his material and his psychological needs more readily. However, selling also introduces a clash between the salesman and the consumer. Whereas the consumer must decide on how best to apportion his income among his various needs, the salesman must sell the consumer *his* product to the possible exclusion of other products. The consumer may be unable to decide whether to buy a washing machine or a vacuum cleaner. Each of the competing salesmen will put pressure on him to buy *his* product, not the other salesman's. Men who sell competing brands of the same product try to exclude each other from getting any part of the consumer's business. As a result, the consumer often finds that the service factor in selling has become minimal because the salesman's behavior is patterned according to his own needs rather than the consumer's. This results in a conflict involving both individuals.

The psychologist should recognize this basis of conflict in selling and study the sale from the point of view of both the customer and the salesman. He can make a scientific contribution along either line provided he does not resort to idle speculation and "arm-chair reasoning."

STERILITY OF SALES FORMULAS

SOME psychologists and many sales managers have in the past proposed formulas for successful selling. The many intangibles connected with the selling process have led to the introduction of systems designed to make selling easier. Many of these systems use a sales formula based upon psychological concepts. The most widely known formula, and one which was in existence before the turn of the century, is known as "A-I-D-A." Although the explanations of this formula vary, the basic idea is that a buyer has a mental stream and that a sale meets with less resistance when the talk follows this mental stream. The letters A-I-D-A stand for attention, interest, desire, and action. Thus the salesman is supposed to begin by gaining the attention of the customer. Once he has done this, he is supposed to arouse in the customer a state of interest and to build it up so as to create desire. When the desire is sufficiently strong, action follows—the act of purchasing the product. Some people add an "S" to the formula to stand for "satisfaction," a frame of mind which is supposed to follow the act of purchasing and predispose the customer to begin the "A" again. To assume that such a mental stream exists in the mind of the potential purchaser is ridiculous. Furthermore, it is an oversimplification, for the chances are that the mental processes of the successful salesman and the overwhelmed buyer are not so simple. A salesman who was really concerned about the extent of the interest which must be present before the desire appears would probably resort to so much introspection and speculation that he would lose the sale. Salesmanship is a practical matter and the successful salesman is the person who learns its techniques and is not too concerned with psychology.

Another selling formula that is equally sterile is: Want—Solution—Action—Satisfaction. According to this formula, the salesman is to determine the existence of or create a want in his potential customer. As soon as this unbalanced state has made the buyer miserable enough. the salesman suggests a solution which, oddly enough, happens to be just the product he has on hand. In order for the customer to regain his balance, he must take action, that is, buy the product. This "satisfies" him, but only until another want is created at another time.

This is not to say that people do not have wants of a psychological or material nature. Of course they do. A product is for sale and the consumer may buy it, whether he wants it or not. The point is that there is no need to introduce psychology in such a situation.

A good scientific principle is to explain behavior along the simplest lines. Applying this principle here shows that much of salesmanship is not psychology. A selling formula, on the other hand, is an oversimplification of behavior. Both the salesman and the customer are complex individuals. The wants, needs, desires, and motives of both are not really reducible to a single drive; and so sales formulas, in most instances, are artificial. A salesman will do well to disregard such formulations if he wants to succeed.

AIDS TO SUCCESSFUL SELLING

SELLING is a diverse occupation. At one extreme is the girl who stands behind the counter of a Five-and-Ten, puts the item the customer wants in a bag, and collects his money, after checking the price of the article. This person is usually called a sales clerk. However, many selling jobs are much more complicated. The selling of an intangible, such as insurance, demands a great deal more salesmanship, as does the selling of the complex machines which form the backbone of our industry.

Even though there are variations in sales techniques, there is nevertheless a common core of activity that runs through most sales. This includes:

1. Starting a sale.
2. Sizing up the customer.
3. Presenting arguments.

4. Meeting objections.
5. Narrowing the field to one item.
6. Closing the sale.

Before discussing each of these steps, we should emphasize that they constitute a psychologist's view of selling. Basically they are related to successful selling; only incidentally do they happen to have anything to do with psychology. They are primarily concerned with salesmanship; they can be considered psychological only when they are thought of as the intercourse of two people. The mainstay of the psychologist is the factual data gathered as the result of experimentation. There has been practically no experimental work in the field of selling, but there has been much speculation. The writer takes the liberty of offering these six aids to selling on the basis of his past experience as a salesman rather than as a psychologist.

It is up to the salesman to begin the sale. The general practice in some department stores of insisting that their salesmen use a hackneyed phrase, such as "Good morning, may I serve you?" bears out this point. A sale is consummated as a result of conversation, and it is best to have the salesman begin it. Possibly just "Hello" and then a brief sentence about the item that the customer is looking at would serve as well. In starting the sale, it is important for the salesman to put the discussion on as warm and friendly a basis as possible. He should study the customer's reactions and decide on whether he is verbal or not, modifying his sales talk accordingly. Some people will buy if the salesman does a lot of talking, and others will buy if he says very little beyond merely answering questions.

This leads to the salesman's "sizing up the customer." While it is not claimed that such an evaluation is infallible, the experiences of many salesmen indicate that it is both possible and valuable. Moreover, "sizing up the customer" is not based upon intuition or mystical forces; it is simply an attempt to judge by observable evidence. For example, the way a person dresses and talks often indicates the price line he is most likely to be interested in—a conservatively dressed customer usually prefers conservative merchandise.

This aid to successful selling can be used to advantage in determining how much the customer is ready to buy. It is also useful in building sales volume because the salesman can spend more time with people who are ready to buy and less time on the others. For example, most sales of expensive household items are made when the husband and wife are together. This is an important clue for the salesman. Similarly, few people are likely to buy expensive items without some previous information; and if the salesman can gauge the extent of the information the customer already has, he can gear his sales technique accordingly.

One of the most important parts of the sales process is the presentation of arguments in favor of the product. When the salesman has a knowledge of his merchandise as well as a technical background, he is in a position to present the most forceful arguments. A successful furniture salesman knows many things in addition to the fact that a particular chair or suite is "good-looking." He knows something about the different types of wood used for furniture and also something about the more technical aspects of furniture construction. He is able to discuss period furniture, and a knowledge of interior decorating is not harmful. The salesman who can present his arguments in a highly informed and factual manner sounds impressive and does not give the customer the idea that he is arguing with him or begging him to buy because he has to make a sale. When salesmen do not know all there is to know about the product they are handling, or do not believe in its value, they may resort to high-pressure methods. This is unfortunate. Reputable companies do not encourage such an approach. Although high-pressure salesmanship may result in a sale, it also increases the number of exchanges and returns. Furthermore, it often creates an unpleasant impression in the mind of the customer and he may believe that the company has taken advantage of him.

The salesman must be ready to meet a customer's objections with factual information; he must not become emotional about them. It is during this part of the sale that competitors enter the discussion. Stressing the advantages of your product and attempting to eliminate a competitor from the discussion as much as possible is generally regarded as good sales technique. Knocking competitors often makes the customer want to hear what they have to say; and if they have been misrepresented, he is likely to assume that the entire sales presentation has involved gross misrepresentation.

If a sale is to be made, the customer must decide or be persuaded to purchase a specific item. The sale is made after the customer, with the aid of the salesman, has eliminated all but one of the possible selections. An outstanding illustration is the sale of ladies' hats. The typical millinery shop has mirrored tables and comfortable chairs, but no hats are to be seen. The customer is invited to sit down and the saleswoman brings her a hat which she tries on. The salesgirl says "Fascinating," "Scintillating," "Utterly gorgeous," or some such nonsense, but the customer politely asks to "see another one." The salesgirl puts the first hat back in the stockroom and brings out another one. In other words, the emphasis is placed on one hat at a time. Since women's hats are what they are, and a woman can look so vastly different in each of them, concentrating on one item prevents confusion. Similarly, an automobile salesman finds out whether the customer wants a two-door or four-door car and then emphasizes the car most likely to be purchased.

The sixth aid to successful selling is "closing the sale." Some people believe that there is a "psychological moment" in a sale; this is defined as the point when the customer is most ready to buy. Presentation of additional sales arguments beyond this point often hinders the sale. Whether there is such a "psychological moment" is not too important. The fact is that there are ways of closing a sale without using high pressure. Among these techniques are the test close, the order-blank strategy, and the delivery question. In each of these the salesman assumes that he is ready to close the sale and he uses a little push to do so. An automobile salesman who really has to sell a car often uses the test close by asking a question like "What make of radio do you want installed in your car?" If the discussion then centers around the radio, it is a cinch that the car itself has been sold. In the order-blank strategy the salesman starts to write the sale; this frequently works as a close unless the customer has enough nerve to say, "Not so fast!" With the third method, before the customer has come to a definite decision the salesman asks, "Where do you want this sent?" The customer's reply often consummates the sale.

HOW NOT TO BUY

In EDUCATION too much emphasis has been placed on how to sell, and too little, if any, on how *not* to buy. Since most of us are consumers rather than salesmen, there is some point in teaching people how to resist the advances and onslaughts of salesmen. It might well be that if this were done we would have a sounder economy. It is with such a plan in mind that the following suggestions are offered to the consumer, and to the salesman as well when he himself is a consumer.

The most important step for the consumer is to avoid embarrassment. The average individual allows himself to be put in the position of feeling obligated to the salesman. He believes that because he has taken up the man's time he must buy something. He is embarrassed at having to tell the salesman that he really does not want the product or that he cannot afford the amount of money involved. The consumer should keep in mind that the salesman is really not doing him a favor; it is a simple business transaction and should be treated as such. During the war years when there was a shortage of consumer goods, customers had ample apportunity to realize this. As the buyers' market returns, it will be well for the consumer to remember that, just as the salesman had no personal and compelling reasons to "sell as a favor" then, so he does not have them now.

Another aid to successful "not-buying" is not to allow the salesman to present his smooth flow of arguments uninterruptedly. At some time during the sales talk, the customer should disagree with one or more of his statements; this often puts the salesman at a disadvantage. Another means of gaining the advantage is for the consumer to indicate early in the sales talk that he only wants information and does not intend to buy; in this way he avoids embarrassment. Just as it is important for the salesman to concentrate on one item, so it is important for the customer not to let him do so. The salesman often gives his customer the idea that unless the sale is closed immediately, someone else will snap up the bargain or the price will go back to its regular and higher level. Here the customer might do well to say something like "I'm a fatalist, anyway"; in other words, if he misses out on this particular bargain, there will be another which may be equally good or possibly better.

The consumer who has been educated in "how not to buy" will nevertheless purchase considerable quantities of "stuff" in his lifetime. However, he will probably buy more of the items he really wants and needs, and less of the marginal items he cannot afford but buys because of the salesman's tactics. This is not to suggest that there must be continuous war between consumers and salesmen, but if the salesman has special information on how to sell, the customer should at least be able to balance this with information on "how not to buy."

CONTRIBUTIONS OF PSYCHOLOGISTS TO SELLING

Psychologists are qualified to improve the techniques of hiring personnel; therefore their major contribution to the field of selling has been in the selection of salesmen. Their work has proceeded along three lines. The first is the construction of standard and weighted application blanks. An application blank can become a tool in refining selection procedures. Comparing the background items of good and poor salesmen has shown that the two groups differ in such factors as age, marital status, previous job experience, and membership in clubs. Numerous studies have indicated that such items on the application blank can be scored in plus or minus values on quantitative scales.

A planned interview which covers a number of specific points is the second line along which psychologists have been working in the field. Although such interviews are useful in hiring salesmen, too often the salesmanager does not know how to conduct them properly. When a person is trained to ask relevant questions and allow the applicant to talk freely, the interview is useful in selection. The use of a rating scale during the interview is both convenient and valuable, for it encourages the interviewer to look for observable traits and rate them on an obective basis. For example, if one of the items to be judged is the applicant's sense of responsibility as shown by his previous experience in accepting assignments and carrying them through, a series of questions could be asked which would attempt to measure this trait.

A five-point scale might be constructed. The item at one extreme might be "refuses or fails responsibility." The second item might be "requires pressure to carry out task." The third, "handles responsibility with average success."

The fourth, "accepts jobs and does them well." The fifth and most favorable rating would be "thoroughly responsible." With such a scale the interviewer would be able to make a summary judgment about the applicant which he could compare with that of various other applicants. Depending upon the company's policy, other traits—manner of speech, physical appearance, friendliness, initiative—might also be rated by the interviewer.

The psychologists' third line of work in this field is psychological testing. Two earlier chapters have described psychological tests and their use in industry. Since all of that material applies to their use in improving the selection of salesmen, only a few brief references will be made to specific work on the test selection of salesmen.

Ohmann (*10*) analyzed 31 items on one company's application blank and found that 13 of them were related to the criteria of success. These items are age, height, marital status, number of dependents, amount of insurance carried, amount of indebtedness, education, number of clubs, years on last job, experience in maintenance, average number of years an all previous jobs, average monthly earnings on last job, and reasons for leaving last job. These items were given weights on the basis of a scale and a critical score was determined which was found to be effective in selection. In addition to the weighted application blank, this particular company conducts three planned interviews and uses a psychological test developed for it. The test consists of three parts pertaining to "difficult sales situations," "building maintenance problems," and "arithmetical computation."

Otis (*11*) has developed a chart on which the applicant can be rated on various traits as the result of an interview. He also gave applicants the Strong Interest Blank, the Bernreuter Personality Inventory, and an intelligence test. Otis found that there was a relationship between the personal items and the criteria. The Strong Interest Blank, when scored for life insurance and real estate selling, was also related to the criteria, but the Bernreuter showed no relationship.

Considerable research has been done in the selection of insurance salesmen, and the Life Insurance Sales Research Bureau has developed an aptitude index which is used by many insurance companies. Kurtz (7) has devised a test, the first part of which covers personal history; and the second is concerned with personality characteristics. This test has been used with some success in selecting life insurance salesmen.

The Klein Institute of New York City evaluates the qualifications of applicants for sales positions by means of a battery of standard tests (see Flemming, 5). The battery includes the Otis Self-Administering Higher Examination of Mental Ability, Canfield's Sales Knowledge Test, the Strong Interest Blank, the Bernreuter Personality Inventory, the Moss Social Intelligence Test, and the Washburn Social Adjustment Inventory. The personality traits measured are stability, self-sufficiency, extroversion, dominance, self-confidence, social mixing, tact and diplomacy, sympathy to people, happiness in personal and social life, etc. The scores on the test battery are analyzed by a person who has not seen the applicant. This organization has established a set of norms based upon a random selection of 893 salesmen in 96 different companies. It reports that patterns of test scores vary for different companies and for different selling operations, which indicates that there is no single pattern of sales success. As evidence of the value of its procedure, this organization reports that 80 per cent of the salesmen judged satisfactory on the basis of the analysis of test scores were later rated satisfactory by company executives.

Fleming (5) also reports a study in which ten men from a group of 17 applicants were recommended for employment; all 17 were hired. Nine of these ten were still employed after one year and were considered successful; the tenth had left the company to return to his former job. Five of the seven men who were not recommended but were nevertheless employed had left the company within a few months.

It appears that psychologists can make their major contribution to selling by improving selection techniques along three lines: First, by determining the personal items that are related to job success and devising a scoring system to increase the objective evaluation of these items. Second, by improving the validity of the interview and introducing a rating scale to aid salesmanagers in judging applicants. Third, by using psychological tests which are correlated with criteria of success.

Another area in which psychologists might be helpful is in making recommendations for effective sales presentation based upon experiments. Not much has been done along this line up to the present time, but some work by Mitchell and Burtt (*9*) indicates that this approach is not beyond the realm of possibility. In their experiment they had a salesman use four contrasting methods on subjects in a simulated sales interview. The four methods were:

1. Demonstration vs. oral elaboration.
2. Presentation of facts vs. short-circuit appeals.
3. Breezy vs. dignified approach.
4. Domineering vs. friendly approach.

According to these subjects, the demonstration, factual, and friendly approaches were superior to their respective opposites, but there was no difference in the breezy and dignified approaches.

Another novel study made by Fay and Middleton (*4*) attempted to determine the relationship between sales ability and the rating of transcribed voices of salesmen. The sales group consisted of 14 men and 15 women employed in a large department store and included both superior and inferior salesmen. Each individual read a prepared sales talk into a microphone. College students rated the transcriptions for enthusiasm, convincingness, and sales ability. The results indicate that the inferior and superior salespeople could be distinguished on all three items.

SUMMARY

THE psychologist's contributions to the field of selling lag behind those made in connection with consumer research and advertising.

Sales formulas framed on "psychological" concepts are sterile; they provide no useful or effective aids in sales success. The six steps in selling are: starting the sale; sizing up the customer; presenting arguments; meeting objections; narrowing the field to one item; and closing the sale.

Since there are more consumers than salesmen, people should be educated in "how *not* to buy." This does not mean a continuous war between salesmen and consumers. No consumer should be embarrassed because he does not buy; he should recognize the salesman's tactics and know how to counteract them.

The psychologist's major contribution to the selling field is the development of more refined techniques for hiring salesmen. The weighted application blank, the standard interview bolstered by rating scales, and psychological tests have proved useful in the hiring of more efficient sales personnel.

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21. Summary and Integration

INDUSTRIAL psychology can be successfully applied to encourage and promote democracy in industry. Our political democracy can survive and thrive provided further steps are taken to demonstrate that business and industry operate most efficiently in such a society. It would be paradoxical to insist that a political democracy is best and not maintain that an industrial democracy is also best. In order to achieve this objective, the individual employee and his relations with his fellow employees and superiors have been considered of paramount importance in this book. The goal of industrial psychology was set as the maximum satisfaction of man in his work world rather than any incidental increase in "efficiency."

The Hawthorne Studies were reviewed as a means of best understanding the interrelatedness of the various topics in industrial psychology and demonstrating that conclusions must be based upon experimentation rather than on exhortations and claims. These studies are of tremendous significance because they show the role of the worker as a social being in a social setting. They emphasize that industrial experimentation which omits consideration of the workers' attitudes is likely to lead to false claims and erroneous conclusions.

Attitudes, job satisfaction, industrial morale, and incentives comprise a unit and are of primary concern to the industrial psychologist. Knowledge of people's attitudes in relation to work and life makes possible an understanding of the complex phenomena known as job satisfaction and industrial morale. Depending upon these three, an incentive system may or may not work. It is important that adequate measuring instruments be introduced before prediction of these aspects of the human factor is made. Because of his training and background, the industrial psychologist can operate most successfully in this area.

In the chapter on measuring attitudes, the primary concern was methodology. Five methods were suggested: impressionistic, guided interview, unguided interview, questionnaire, and scale. Discussion of the advantages and disadvantages of each method led to the conclusion that no single method could be considered uniquely superior. The method to be used depends upon the problem; and it is likely that a combination, rather than one method alone, will produce the most fruitful results in measuring attitudes and solving the related problems.

The evidence available makes clear not only that employers and employees have attitudes, but that their attitudes toward each other differ from their attitudes toward themselves. A clearer understanding of the differences in the attitudes of these two groups will lead to greater mutual sympathy. Lack of knowledge or an insistence that the two groups have similar attitudes will lead only to lack of sympathy and understanding.

Job satisfaction was defined as the result of an individual's attitudes toward his job, related factors, and life in general. Of the two views of job satisfaction, the first considers only specific factors on the job or factors related to it. The second is more comprehensive, for it recognizes that in addition to these specific factors there are factors basic to the individual's abilities, interests, and personality. Acceptance of the latter view requires that personnel departments which use scientific selection procedures attempt to relate people and jobs so that job factors will not frustrate the individual and create dissatisfaction. In order to gather uniform data, it was suggested that a modification of Woods' scale be used more widely and the results reported more freely. The seventeen areas covered by this scale enable comprehensive consideration of specific job factors.

Industrial morale was defined as an individual's feeling of being accepted by and belonging to a group of employees because of his adherence to the common goals and his confidence in their desirability. The four determiners of morale are (1) a feeling of togetherness, (2) need for a goal, (3) observable progress toward a goal, and (4) individual participation in meaningful tasks necessary to achieving the goal.

Morale can best be appraised by studying group and subgroup formations. The principles of sociometry as developed by Moreno and the modifications made by Jenkins in his nominating technique are useful in understanding group structures. Among the methods used to increase industrial morale are the expert approach, the industrial "spy," the industrial counselor, and the employee problem approach. For problems of an intimate personal nature the industrial counselor method holds the greatest promise, but for group problems the employee problem approach is recommended. This method encourages the use of democratic processes in arriving at the solution of the problem. Such specific items as posters, slogans, and speeches, which are ordinarily considered to be "morale boosters" in and of themselves, apparently are of little value unless the group decides to adopt it and it meets the requirements of the four determiners of morale.

Industry has overemphasized the importance of the financial incentive. All the numerous wage-incentive systems are based upon the erroneous assumption that a financial incentive always increases production. The Bank-

Wiring employees in the Hawthorne Studies did not respond in the predicted manner to a financial incentive, and they cannot be considered exceptions to the rule. There are many reasons why people work. A fruitful lead in understanding the complex web of these motives is to obtain data from typical workers with the case history method. The most effective incentive is the one that enables the goal of both employer and employee to be achieved. An incentive aimed at reaching an employer's goal is not as strong as one which will achieve not only his goal but also that of the employees.

Chapters 7 through 11 comprise the second unit of this book. Job analysis, job training, time and motion studies, fatigue and related phenomena, and work environment are primarily concerned with making work more efficient by increasing production. It is important to recognize that these procedures cannot stand alone. From the point of view of industrial psychology they play a secondary role to the topics considered in the first unit. Work has been done in these areas by industrial engineers and there is considerable overlapping between the two fields. The psychologist's advantage is his awareness that successful time studies or favorable changes in work methods depend as much on considering the employee in his work setting as upon the particular result.

Job analysis is the basis of this second unit. A job analysis is an accurate study of the various components of a job from the point of view of both job and man. It has many uses and is equally important in small and large organizations. The job psychograph and the occupational ability pattern are two illustrations of psychological contributions in this field; both attempt to match the employee's ability to the job. The occupational information that results from the integration of various efforts to make job analyses is useful in vocational guidance and selection as well as in industrial psychology.

The correct application of principles of learning results in economy of training. Learning rarely ever takes place without motivation; a good teacher, whether in school or in industry, recognizes this fact, as well as the various stages of the learning process. Schools and colleges have much to contribute to industry in training new employees and retraining older ones. Closer cooperation between the two, in the form of "cooperative education," is one of the best methods of providing industry with qualified applicants for jobs.

The teacher in industry needs training in how to teach. An experienced worker is not necessarily a good teacher, nor can a person teach unless he knows his subject or the job the employee must learn. Too few companies have recognized the great importance of training. The newer methods of education which embody discussion, demonstration, and actual performance are better than the more formal type of drill and lecture; hence companies contemplating training programs will benefit materially by applying the "newer" methods.

Time and motion studies when used correctly can result in greater efficiency. The greatest difficulty has been in their misapplication and in failure to acknowledge the psychological resistance to change. Another difficulty in studies made for the setting of wage or production standards has been the inadequate scientific treatment of allowances and the use of norms based upon too limited a sample. Time study can be a tool for both management and labor. The International Ladies Garment Workers Union has conducted such studies as an aid in collective bargaining. The average employee is capable of considerable improvement in his work methods if he is encouraged to follow the simple principles of time and motion studies.

A major problem in industry is not the study of fatigue but rather the relationship between hours of work and production. The preponderance of evidence permits the generalization that a shorter work week is accompanied by a rise in production rather than a decrease. Not the nominal work week but the actual work week must be considered in computing production costs. Lateness, absenteeism, and other factors make inroads on the nominal work week. Reducing the nominal work week does not necessarily reduce the actual work week. Overtime adds to the nominal work week but may not add nearly as much to the total number of actual hours worked. For this reason it is often costly and inefficient.

The introduction of changes in the work environment has often resulted in unwarranted claims primarily because of the lack of sound experimentation. This area needs more careful experimental work before such claims can be considered as substantiated. An increase in production that follows the introduction of music, color schemes, or better lighting may be due only partially to the changed factor; some of it may be due to the fact that a change has been made. Employee attitudes and relations between employees and employer may also contribute to the increased production. Music in industry is the newest of a series of environmental changes. More careful experimental work has been done on it than on many of its predecessors and it is possibly because of this that the claims advanced for it have not been as weird. Production changes are usually positive but slight.

In the chapter on accidents the need for caution in interpreting the principle of accident proneness was brought out. A report that a small percentage of a population has a large percentage of the accidents does not establish support for the concept of accident proneness, for such figures are likely to result merely from chance expectancy. By recognizing that many factors contribute to accidents and by considering differences in the degree of an individual's accident proneness as a minor rather than a major factor, more can be accomplished in reducing accidents. Two approaches to the reduction of accidents related to the human factor are the clinical method and the educational campaign. The former tests, analyzes, and reeducates the individual, whereas the latter makes a group appeal. Accident reduction can be brought about by employer and employee working together for their mutual advantage. It can become one effective means of introducing and encouraging democracy in industry.

Leadership and industrial warfare are deserving of more serious study not only by psychologists but by all who are concerned with promoting democracy as a way of life. Regardless of the level of leadership, the problem confronting a leader is basically the same—the maintenance of a successful superior-subordinate relationship, for only then can leadership be considered effective. Democratic leaders encourage independence of their subordinates. Memorizing rules of behavior is no guarantee of effective leadership. Leaders should delegate authority, be available to employees, etc.; they should not simulate knowledge, interfere with work, or give too many or conflicting orders.

Role practice is a very promising technique for the training of leaders. The nominating technique apparently can select potential leaders early in their career.

Industrial warfare, a breaking-down of our industrial society, is promoted by either management or labor in its quest for power and its determination to gain prestige in the eyes of the worker. Groups of all kinds are formed in our society for many compelling psychological, social, and economic reasons. For one group to fight another or to charge that the other is un-American is often merely an evasion of the basic issues. As a sounder and more democratic pattern of leadership emerges and as the groups involved in industrial conflict assume more democratic characteristics a more mature solution of the problems can be anticipated. Honest and sincere collective bargaining on matters of joint control appears to offer the solution.

A brief review of the effects of unemployment reveals a behavior pattern in which serious deterioration of the individual takes place. The unemployed tend to have two behavior manifestations that are normally not characteristic of the employed—irrational spending and loss of the sense of the passage of time. Although most authorities agree that unemployment should be fought, there is disagreement as to whether the local community or the federal government should carry on the battle. Both have their advantages and disadvantages, but there is nothing to date to indicate that one approach is so much better as to preclude the other.

The accepted role of the psychologist in industry is testing applicants for employment. Within limits, tests can be useful in improving the selection process. However, the greatest danger in their use in industry is their being oversold. Their indiscriminate use will result only in dissatisfaction on the part of those paying the bill. Tests can be successful only when a correlation between job success and test results has been established. A psychologist with experience in this field should be called in when a firm contemplates the introduction of a test battery. He will be careful to determine that the employer's problem can be solved by means of testing. He will conduct the necessary research, but he cannot be expected always to make a positive recommendation on the use of tests, even after he has made a thorough study. Some experiments on testing in industry were reviewed to emphasize the care and caution necessary in this field, and the problem faced by the applied psychologist was brought into clear focus. Research must be conducted on the industrial scene, but it often requires modified and somewhat unorthodox procedures. His choice is either to adopt these procedures or to retire to the security of a laboratory which is frequently too far removed in meaning from the real problem.

The last unit of this book includes the three chapters on consumer research, advertising, and selling. Consumer research is designed to determine the attitudes, needs, and wants of those who use the particular product or service. It illustrates the value of research in making business more efficient. In certain respects, business rather than scientific tendencies have prevailed in this field, and there have been hints of secret methods and results. Market research cannot justifiably claim secrets. Even those who know the secrets of the atom bomb admit that the secrets concern the time and money required to produce the bomb, rather than the method. Too much emphasis has been placed upon report presentation and not enough on the basic procedures of gathering the data. More care should be exercised in training and supervising those who collect the data upon which the reports are based.

In the related fields of advertising and selling there has been a tendency to misuse and misunderstand psychology. The "psychology of selling" is mainly the salesmanager's idea rather than the psychologist's. The psychologist's major contribution in advertising is the introduction of research methods and of restraint in interpreting results which might be claims not necessarily based on fact. Psychologists have also been helpful in devising more refined procedures for the selection of salesmen.

A LOOK TO THE FUTURE

RESEARCH will become more and more important in the solution of problems confronting business and industry. Snap judgments based on intuition and trial-and-error methods will prove too costly as more people recogize the value of obtaining facts backed by scientific methodology.

This book has attempted to reveal the body of knowledge known as industrial psychology and to show its application to everyday problems confronting both management and labor. Industrial psychology cannot be made a tool for promoting the special aims of either group. It is well fitted to serve the community because its scientific basis prevents bias and prejudgments.

The knowledge of industrial psychology will continue to expand at an accelerated rate in the years immediately ahead. The most fruitful findings will follow work in the fields of leadership, labor-management relations, training in industry, and refinement of selection techniques. The discipline of industrial psychology will prevent unsubstantiated claims about work environment changes, advertising, and motion study provided psychologists are given an opportunity to work in these fields.

Test Appendix

Various psychological tests are referred to throughout the text, but in order to maintain continuity there is little or no description of some of them. The following list of the more commonly known tests includes the author, a brief description, time, validity, reliability, and the book page on which they are mentioned. The validity and reliability coefficients are approximations and should be regarded as typical but not necessarily exact.

BLUM SEWING MACHINE TEST, by M. L. Blum.
Description. Subject is required to trace on a line and between two lines with the needle of the sewing machine.
Time. 10 minutes.
Validity. Discriminates between highest and lowest quartile of employed operators.
Reliability. + .80.
Page. 380.

CANFIELD SALES KNOWLEDGE TEST, by Canfield.
No information in the literature to the best of the writer's knowledge.
Page. 486.

FINGER DEXTERITY TEST, by J. O'Connor.
Description. Measures fine finger movements. Using only one hand, the subject is required to place three pins in each of 100 holes on a plate.
Time. 15 minutes.
Validity. None reported; some occupational differentiation.
Reliability. + .90.
Pages. 101, 169, 170, 387, 396.

GENERAL APTITUDE TEST BATTERY, by U. S. Employment Service.
Description. A battery of 15 tests measuring ten aptitudes, such as intelligence, form perception, manual dexterity, spatial ability, etc.
Time. 135 minutes.
Validity. Validation on samples of workers employed in various occupations.
Reliability. Not reported.
Page. 412.

GUILFORD MARTIN PERSONNEL INVENTORY, by J. P. Guilford and H. G. Martin.

Description. A questionnaire measuring three traits: cooperativeness-faultfinding, objectivity-personal reference, agreeableness-belligerence. Questions similar to those on the usual inventory tests.

Time. 20 minutes.

Validity. Industrial validation differentiating groups of employees.

Reliability. + .85.

Page. 409.

INDUSTRIAL CLASSIFICATION TRAINING TEST, by C. H. Lawshe and A. C. Montoux.

Description. Problems involving fundamental mathematical operations presented by means of several working drawings of material appropriate for industrial students.

Time. About 30 minutes.

Validity. + .71 with grades in an electricians' training course.

Reliability. + .73 to + .94.

Page. 407.

KIMBERLY-CLARK PACKING AND INSPECTING TEST, by C. E. Jurgensen.

Description. Subject required to sort blocks and pack them into a compartment. This test, developed in industry, is easily transportable and relatively standardized from trial to trial.

Time. 20 minutes.

Validity. + .60.

Reliability. Low.

Page. 395.

MACQUARRIE TEST FOR MECHANICAL ABILITY, by T. W. MacQuarrie.

Description. A pencil and paper test, with seven subtests. Measures tracing, tapping, dotting, copying, tridimensional block counting, space perception, visual tracing.

Time. About 30 minutes.

Validity. Correlation with ratings, about + .50.

Reliability. + .90.

Pages. 385, 407.

MECHANICAL APTITUDE TEST, by L. J. O'Rourke.

Description. A pencil and paper test measuring information concerning tools and mechanical processes.

Time. 30 minutes.

Validity. + .64 to + .84 with shop ratings.

Reliability. Not reported.

Pages. 407, 408.

MECHANICAL COMPREHENSION, by G. K. Bennett.

Description. Sixty pictorial problems relating to understanding the principles of physics involving mechanics.

Time. About 30 minutes.
Validity. Coefficients with occupation, + .3 to + .6.
Reliability. + .90.
Pages. 407, 408.

MINNESOTA MECHANICAL ASSEMBLY TEST, by D. G. Paterson and others.
Description. The subject is to assemble from its parts, without instructions, each of a series of such common objects as monkey wrench, bicycle bell, links of chain, hose clamp, etc.
Time. About 20 minutes.
Validity. Correlation of + .55 with shop output quality.
Reliability. + .90.
Page. 170.

MINNESOTA RATE OF MANIPULATION TEST, by W. A. Zeigler.
Description. A board with 60 round holes and 60 round blocks. The placing test requires the subject to put each block into a hole. The turning test requires him to turn over each block in its hole, using two hands.
Time. About 15 minutes.
Validity. None reported; some occupational differentiation.
Reliability. + .90.
Pages. 169, 170, 405, 406.

MINNESOTA SPATIAL RELATIONS TEST, by D. G. Paterson and others.
Description. A measure of two-dimensional spatial relations on the performance level. The test consists of 58 odd-shaped and different-sized blocks that fit into appropriate spaces on a board. Four boards comprise the test.
Time. 20 minutes.
Validity. + .50.
Reliability. + .80.
Page. 170.

MINNESOTA VOCATIONAL TEST FOR CLERICAL WORKERS, by D. M. Andrew and D. G. Paterson.
Description. A name-checking and number-checking test that emphasizes speed and attention to minute detail.
Time. 15 minutes.
Validity. + .37 to + .65.
Reliability. + .90.
Pages. 169, 170, 406, 408.

MOVING-ROAD-SCENE DRIVER TEST, by H. De Silva.
Description. Subject presented with reasonable reproduction of driving on the road. Test measures general motor aptitude, particularly coordination; speed of reaction, and ability to do several things at once.
Time. 10 minutes.

Validity. None reported.
Reliability. None reported.
Pages. 234, 290.

OTIS SELF-ADMINISTERING TEST, by A. S. Otis.
Description. A measure of general intelligence. The 75 items include arithmetic, vocabulary, reasoning, etc. Easy to administer and to score.
Time. 20 minutes.
Validity. Indirect evidence that it measures intelligence.
Reliability. + .90.
Pages. 385, 406, 407, 408, 486.

PERSONALITY INVENTORY, by R. G. Bernreuter.
Description. Questionnaire type of test that measures six personality traits: neurotic tendency, self-sufficiency, introversion-extroversion, dominance-submission, self-confidence, sociability.
Time. 20 minutes.
Validity. + .90 with other tests.
Reliability. + .90.
Pages. 485, 486.

PERSONNEL TEST, by E. F. Wonderlic.
Description. A brief test containing 50 questions that measure arithmetic problem solving, vocabulary, reasoning, and similar items included in pencil and paper tests of intelligence. Really a refinement of the Otis Self-Administering Test.
Time. 12 minutes.
Validity. + .85 with Otis Self-Administering Test.
Reliability. + .90.
Page. 385.

PREFERENCE RECORD, by G. F. Kuder.
Description. Over 300 paired comparison items, arranged and scored to give a profile of preference scores with respect to scientific, computational, musical, artistic, literary, social service, and persuasive activities.
Time. 40 minutes.
Validity. Correlated with adults' statement of interest to extent of + .75.
Reliability. + .90.
Page. 102.

REVISED MINNESOTA PAPER FORM BOARD, by R. Likert and W. H. Quosha.
Description. Geometric figures and five possible solutions presented to the subject, who is to choose the parts that constitute the figure. A measure of spatial relations of a two-dimensional character involving imagination rather than actual manipulation.
Time. 20 minutes.

Validity. None reported; some occupational differentiation.
Reliability. + .90.
Pages. 405, 407, 408.

RORSCHACH PERSONALITY DIAGNOSIS, by H. Rorschach.
Description. A projective technique test which requires the subject to report what he sees in a series of standardized ink blots. Examiners must be trained in the scoring techniques and experienced in clinical practice.
Time. 40 minutes.
Validity. High, on basis of clinical diagnosis.
Reliability. Approximately + .80.
Pages. 386, 387.

SOCIAL INTELLIGENCE TEST, by F. A. Moss and others.
Description. A pencil and paper test that attempts to measure differences in ability to respond to social situations; questions are given orally to the subject. People with general intelligence may answer correctly, even though they have no knowledge of correct behavior in such situations.
Time. 40 minutes.
Validity. No satisfactory evidence.
Reliability. Not reported.
Page. 486.

SPECIFIC INTEREST INVENTORY, by P. P. Brainard and F. G. Stewart.
Description. Twenty groups containing five items each, designed to measure interest in such activities as physical work, vocal expression, etc.
Time. 30 minutes.
Validity. No clear report.
Reliability. + .68.
Page. 102.

TEMPERAMENT SCALE, by D. G. Humm and G. W. Wadsworth.
Description. A questionnaire yielding a profile score on seven "components of temperament": normal, hysteroid, manic cycloid, depressive cycloid, autistic cycloid, paranoid schizoid, and epileptoid.
Time. 30 minutes.
Validity. High validation claimed on basis of psychiatric diagnosis.
Reliability. + .85.
Page. 409.

THEMATIC APPERCEPTION TEST, by H. A. Murray.
Description. A series of pictures is presented to the subject, who is to use his imagination in making up a story about each picture. A projective technique requiring trained and experienced examiners.
Time. 60 minutes.

Validity. High, on basis of clinical diagnosis.
Reliability. Approximately + .80.
Page. 387.

TWEEZER DEXTERITY, by J. O'Connor.
Description. The subject, using tweezers, is required to pick up and place a pin in each of 100 holes.
Time. 10 minutes.
Validity. None reported; some occupational differentiation.
Reliability. + .70.
Pages. 101, 169, 170, 396.

TWO-HAND COORDINATION TEST, by E. J. Benge.
Description. The subject thrusts rods which he holds in two hands into two holes of the same diameter and then into two holes of smaller diameter. Correct thrusts are totaled by a mechanical counter.
Time. 5 minutes.
Validity. Questionable.
Reliability. Not too high.
Page. 384.

VOCATIONAL INTEREST BLANK, by E. K. Strong.
Description. The subject checks his attitude on an inventory of 400 items. Scoring is based on keys for over 30 occupations. Test assumes that interest and ability are highly related and that people in specific occupations have corresponding interests.
Time. About 40 minutes.
Validity. Scoring keys based on statistical analysis of likes and dislikes of people in specific professions.
Reliability. + .88.
Pages. 102, 485, 486.

WECHSLER-BELLEVUE INTELLIGENCE SCALE, by D. Wechsler.
Description. An individual intelligence test whose material is more suitable for adults than the Binet. Subtests include arithmetical reasoning, memory span for digits, picture arrangement, picture completion, etc.
Time. 60 minutes.
Validity. + .82.
Reliability. + .90.
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